

THE IRON AGE

THURSDAY, APRIL 9, 1891.

Engines for Cable Railway Power Stations.

Until recent date the engines for cable railway purposes have all been of the horizontal variety. We illustrate, in the engraving and accompanying drawings, an engine of the vertical type, fitted with Corliss Automatic Liberating Gear, two of which have been placed in the power stations of the Philadelphia Traction Company, Philadelphia, Pa. They were designed and built by Robert Wetherill & Co. of Chester, Pa. This type of engine,

massive and heavy. The bed is of the hollow box pattern, having the seatings for the main journals cast in. The shaft in the journals is 18 inches in diameter and the journals are 36 inches long. The top face of the bed is provided with planed faces for receiving the housing. The bed has been made of unusual depth, insuring ample strength and stiffness under the main journal.

The housing of the A frame is composed of four sections, extending from the top of the bed casting to a point under the cylinder, where it is faced for the recep-

end to bracket faces inside of the housing, while the bottom ends are carried on the intermediate braces. The cross-head is of the box pattern, fitted with steel pin. The lubrication is from stationary sight feed cup through the center. The shoes, which have been given liberal wearing surface, are provided with reliable screw and wedge adjustment.

All the moving parts and lubricating attachments are readily accessible from the two galleries, which are of ample width and extend entirely around the engine. Special attention has been given to the



VERTICAL CORLISS ENGINE FOR CABLE RAILWAY POWER STATION, BUILT BY
ROBERT WETHERILL & CO.

which is also adapted to the requirements of rolling mill, cotton mill and electric power station service, &c., will be of interest to those engaged in the installment of power plants, where large power is required in limited space, and value of floor space is a consideration.

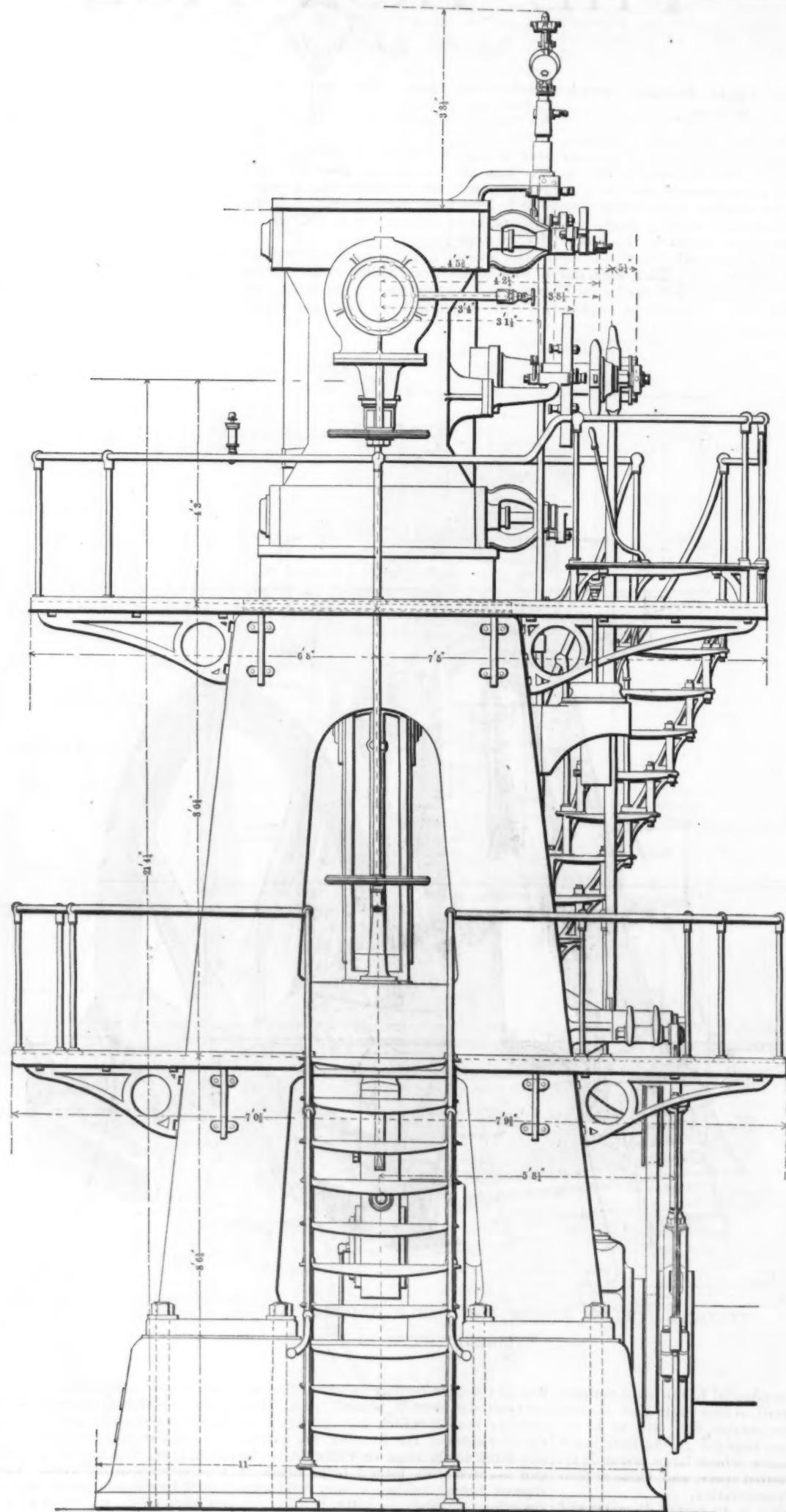
The cylinder is 40 inches diameter and 48 inches stroke, and is rated at 1000 horse-power. The engine throughout is

tion of the base casting in which the bottom cylinder head is formed. The intermediate braces, which are connected to the four sides of the housing, are planed and fitted to the main or vertical sections and secured with turned bolts fitted in reamed holes, making a very rigid construction.

The guide bars are provided with liberal wearing surfaces, and are secured at the top

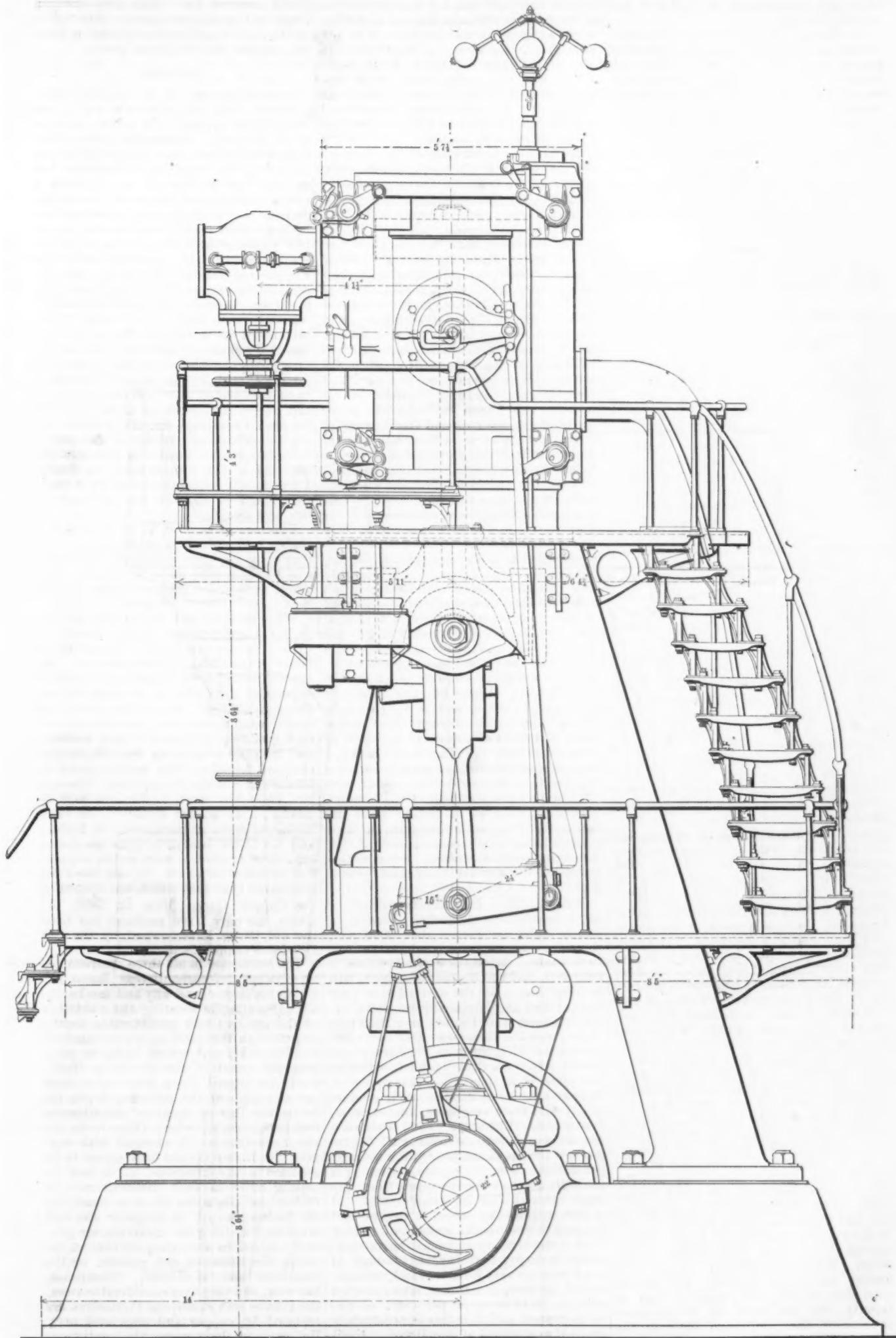
matter of automatic lubrication of all parts, which is so essential for the requirements of day and night running.

The valve gear is of the improved liberating type, with modifications to meet the requirements of the work. The valves are closed by vacuum pots mounted on brackets secured to the sides of the housing. The stop valve, which is for 12-inch diameter pipe, is provided with by-pass



Side Elevation

VERTICAL CORLISS ENGINE FOR CABLE RAILWAY POWER STATION.



End Elevation.

VERTICAL CORLISS ENGINE FOR CABLE RAILWAY POWER STATION.

valve and hand-wheels on the first and second galleries.

The balance-wheel is 24 feet in diameter, weighs 45 tons, and is made in segments planed and fitted together. The segments at the rim are secured together with forged links shrunk on. The shaft in the wheel-fit is 22 inches in diameter. The power is transmitted from the engine to a main line shaft, on which the winding drums are located, by spur gears; the wheels are with involute tooth, machine cut. The pinion on the engine shaft is 6 feet 4.39 inches pitch diameter, and the wheel on the main line shaft 21 feet 5.83 inches pitch diameter.

OUR COPPER RESOURCES.—II.*

BY JAMES DOUGLAS, NEW YORK CITY.

CONGLOMERATE MINES.

The Albany and Boston forms just such a link between the second and third group of mines as the Copper Falls forms between the first and second groups. After failing to work profitably an amygdaloid bed, the Albany and Boston made the first experiment in 1864 in working a conglomerate bed, and thus, through unsuccessful itself, was the forerunner of the most successful and important enterprise on the lake. The Albany and Boston should, therefore, appear at the head of the group of conglomerate mines, followed by the Calumet and Hecla in 1865, and by the Allouez, which though organized in 1859, commenced work on the Allouez conglomerate only in 1869. The Osceola appeared in 1873, but after working for a time on so much of the remunerative portion of the Calumet conglomerate as lay within its lines, it transferred its operations to an amygdaloid bed. The Tamarack, which tapped the Calumet and Hecla conglomerate on the dip of the great ore shute by a vertical shaft, and commenced making copper in 1885, is the latest born of the conglomerate mines.

Several conglomerate beds alternate throughout the series of the Keweenaw rocks with the unaltered traps and with the copper-bearing amygdaloid. In many places they carry traces of copper, but the only one that gives assurance of economic value is the Calumet bed, where, for about 3 miles along its strike, it outcrops on Calumet and Hecla ground, and on the northern edge of the bordering Osceola ground to the south, and the southern edge of Centennial ground to the north. In the center of this long stretch Calumet shaft No. 1 was sunk in what has proved to be likewise the center of the most productive area of this vast shute of ore. Hecla shaft No. 1 adjoins it to the south (for the two companies were distinct until amalgamated in 1872). Within the Calumet lines there have been sunk five shafts, from one to five, numbered from south to north, and within the Hecla and South Hecla lines 12 shafts, numbered from north to south. The disastrous fires of late years crippled the deep, central shafts and shut off temporarily all access to the rich ores of the central zone, but previous to the fire the 700-foot level had been run south to the limit of the Calumet and Hecla property, and had traversed a second chimney of ore in the southern part of the South Hecla, known as the Black Hills section of the mine. With extraordinary energy this almost unexplored territory was opened soon after the first fire occurred, and so rapidly was the work of development prosecuted that, although between the years 1886 and 1887 there was a diminution of product from 22,553 to 20,543 tons of

copper, this was due, not to a contraction in the tonnage stamped, but to a decline in the richness of the ore from 4.22 per cent. to 3.5 per cent. A large quantity of lean ore from the Black Hills Mine, which was necessarily mixed with the richer ores of the central shute, caused the falling off. The next year (1888) showed a still further decline to 3.28 per cent. of copper in the rock treated.

The deepest point reached by the Calumet and Hecla is the twenty-ninth level, which is 3750 feet from the surface on the incline of the bed. As the dip is $37\frac{1}{2}$ °, it makes the vertical depth 2280 feet. This depth corresponds with the fifth level of the Tamarack Mine, but the bottom of No. 4, the deepest Calumet and Hecla shaft, is 4000 feet north of the No. 1 Tamarack shaft. It is therefore assumed that the Tamarack is working on the dip of the South Hecla or Black Hills chimney, and not on the central body. The sinking of the Tamarack vertical shaft to a depth of 2270 feet on the chance of striking the Calumet conglomerate was regarded as a piece of great audacity in mining, for when it was begun in 1882 the lower drifts of the Calumet and Hecla were far above the level at which the vertical Tamarack shaft was expected to pierce the lode. But ere the goal had been reached, in 1885, the Calumet's deepest workings were approaching the same level; so that it became a foregone conclusion that the Tamarack hopes would be realized. Today the Calumet and Hecla has nearly re-equipped the burnt out portion of the mine; it has also opened up a virtually new mine in the South Hecla; it has nearly reached its fortieth level, or a depth of 4000 feet, by its inclined shaft No. 4, and it is sinking a vertical shaft—the Whiting—which in less than two years will touch the central shute of ore at the vertical depth of 3400 feet, or on the sixtieth level. Meanwhile the Tamarack is sinking a third and a fourth shaft, which should both intersect the central shute of the conglomerate at a depth of about 5000 feet, and Tamarack Junior, a company affiliated in ownership with the Tamarack, is sinking to the north of both the Calumet and Hecla and the Tamarack ground, in the hope of finding good ore below the Centennial property, a hope stimulated by the recent success of that latter company in striking remunerative ground to the north of their older workings.

Within this limited range of 3 miles, besides the 25 inclined shafts, of which eight are deeper than 3000 feet, there are sunk, or being sunk, seven vertical shafts, the shallowest of which is 2270 feet, and the deepest of which will be 5000 feet. By the end of this year the Calumet and Hecla will be daily extracting from this limited area 3000 tons of ore, and the Tamarack 1000 tons; but these quantities, great as they are, could certainly be more than doubled within a few years, if it should be the policy of these companies to increase their production. And their neighbors, the Osceola, Centennial, Kearsarge and Tamarack Junior, will contribute in no small degree to swell the grand total. During the next generation these 9 square miles will probably produce more copper than any other equal area on the earth's crust. It is not within the scope of my present purpose to describe the methods of mining or of concentrating and smelting the ore; suffice it to say that the ore, though in some cases so very lean, is readily concentrated, by automatic means, into a product carrying from 30 to 90 per cent. of metallic copper, and that this concentrate is smelted and refined at one fusion. Until lately the smelting was done for the mining companies by a separate smelting company, under contract, at so much per ton of copper. Now the Calumet and

Hecla company have their own smelting plant, and as one consequence, they reduce the loss of copper in the tailings by making concentrates of a lower grade.

Arizona.

Over 90 per cent. of all Arizona copper is derived from oxidized ores, which are found in the southern and middle sections of the territory. Nature has reduced the copper in the Keweenaw rocks of Michigan to metal. In Southern Arizona she has assisted the metallurgist by effecting a partial alteration of the ores to oxides and carbonates. In both cases the action has been attended with the elimination of certain elements injurious to copper, which are almost invariably associated with the sulphurated ores of the metal, and are difficult to extract by the usual smelting methods. Hence copper made from native lake ore ranks highest in quality in the markets of the world, and that made from the oxidized ores of Arizona holds an intermediate place between lake copper and the metal made by the ordinary methods from sulphurated ores. It can be drawn and rolled and stamped into intricate shapes, like lake copper, but it lacks the high electrical conductivity of that exceptionally valuable metal. It possesses the qualities of the copper from the Burra-Burra and Moonta mines of South Australia, which is likewise the product of oxidized ores.

This ore is smelted in water-jacketed cupola furnaces, by a single fusion, into bars of 96 per cent. standard, which are sold by the pound under conditions similar to those which govern the sale of Chili bars.

With insignificant exceptions, all bar copper comes from the three districts of Clifton, Bisbee and Globe. The principal mines in the Clifton district are owned by the Arizona Copper Company, a Scotch organization, and by the Detroit Copper Company. There are several groups of mines, some miles apart, the members of each group being related to one another, and forming a more or less continuous chain of deposits. The first property to be worked was the Longfellow. Though not itself the most productive mine at present, it lies in the strike of the most important series of ore masses. At Bisbee, and for miles around it, there are claims capable of producing more or less copper, but no other large ore deposit has been discovered than that which was opened as the Copper Queen Mine in 1880. At Globe, the only large producer has been the old Globe Mine, owned by the Old Dominion Copper Company.

The ore occurs in all three districts in, or adjacent to, carboniferous limestone, which has been chemically and mechanically influential, in assisting the oxidation of the ore to a very considerable depth; for, through the crevices which intersect the limestone, and which have, in part, been the result of the ore decay itself, water has filtered down from the surface and decomposed the ore to a depth far below the line of decay of the adjacent feldspathic rocks, where these rocks are not themselves heavily charged with copper. In Bisbee the ore beds appear to be confined to the limestone, but follow no regular order in their distribution. In Clifton and Globe, on the other hand, the ore bodies, though of irregular size and occurring at irregular intervals, are generally found in the plane of contact between the limestone and granite, or the limestone and sandstone. Sometimes, however, and then over considerable areas, the granite and sandstone themselves are replaced by copper and associated ores. But even in these cases, the contiguous limestone has apparently played an essential part in the genesis of the oxidized ore. Sulphurated ores of copper are found in all of our extensively worked carbonate

* Read at the New York meeting of the American Institute of Mining Engineers.

mines—sometimes in large masses, which for some cause, not always assignable, have escaped decay—occasionally even at a much higher level than that at which oxidized ores occur in the same mine. The average percentage of copper in the ore is difficult to determine, since unassorted ore is never delivered to the furnaces, while the grade to which it is selected is dependent in each district upon the cost of fuel and transportation. The furnace yield of Copper Queen wet ore is about 8 per cent., but almost as much very lean ore is stowed away in the stopes as is delivered to the furnace bins. The average ores of the other carbonaceous districts are probably richer and their furnace yield is notably higher. The deeper Queen ores consist essentially of ferric oxide associated with cuprous oxide and cupric carbonate, resulting from the oxidation of iron and copper pyrites. They are consequently basic. But sufficient siliceous ore can be procured to supply the necessary acid flux for the furnace mixture. In the other districts, on the contrary, where the ore gangue consists largely of altered granites and sandstones, the siliceous and alumino-silicate constituents have been imperfectly eliminated, and barren limestone must be added to the furnace charge. But in none of the large producing mines does the average of the ore reach the high percentage promised to investors in the prospectuses of undeveloped Southwestern mines.

It will be seen from this sketch that the Arizona ore beds are as strikingly irregular in their distribution as those of the lake are the reverse. The map of a lake mine is like a chessboard, laid out with mathematical precision; that of the deep Arizona mines is more like a tangle of different colored threads.

The only large copper mine in the northern half of the territory is the Verde, in Yavapai County. There the copper occurs in lenticular masses imbedded in crystalline schists, probably of Taconic age. Massive carbonates are found at the surface, but at a shallow depth occur altered sulphurates or oxisulphurates which resemble those of the Southern States and of Butte. In this mine, as in all copper-bearing veins in this section of the territory, notable quantities of precious metals accompany the copper; but the gold and silver are irregularly distributed in the same vein and bear no uniformly definite proportion to the copper.

MONTANA.

Of far greater moment than the copper mines of Arizona are those of Butte, Montana. The principal mines have been opened on a lode which has proved to be continuous and productive for over three miles. The principal mines succeed one another from west to east as follows: Gagnon, Original, Parrott, Anaconda, St. Lawrence, Mountain View, Shannon, Colusa and Hattie Harvey. The gangue of the vein is granitic and softened to a very considerable depth. It contains disseminated particles of ore, but most of the ore is derived from large imbedded masses. One of these in the Anaconda is said to attain a width of 150 feet of solid mineral. Two, or perhaps three, parallel veins, or as many chains of ore masses in one very wide vein are traceable throughout its extent. Everywhere the copper carries silver in proportions varying from 2 ounces per unit of copper to less than $\frac{1}{2}$ ounce per unit. The proportion of silver to copper is greater in the western section of the vein than in its central and eastern sections. The ores of the Gagnon mine are smelted into rich argentiferous matte at the Williams works, which ship their product to the Boston and Colorado Smelting Company, of Argo, Col. The Parrott ores contain about 60 ounces of silver to the ton of copper. The average silver

contents of the Anaconda, Mountain View and Colusa ores is less. Both the Chambers Syndicate and the Boston and Montana Company, however, make rich silver matte, but not from unmixed ores of the great lode.

In following the lode from the Gagnon eastward, one ascends the western slope of a steep hill, traversing the Parrott and the Anaconda to the Mountain View, which covers the summit. In descending the eastern slope of the hill, one crosses the Shannon and the West and East Colusa. The latter is situated in the trough of a valley and was formerly supposed to cover the eastern limit of the lode. But productive ground has recently been found far to the east of this point, extending the length of this vast lode a mile beyond its formerly supposed confines. The mines which lie at the extremities of the most productive section of the lode—viz.: the Gagnon and Original on the west and the Colusa on the east, are likewise lower in level. In them the copper ore came to the surface, whereas in the Anaconda and the Mountain View, which crown the hill several hundred feet above the terminal mines, the surface ores to a depth of 400 feet carry some silver, but no notable quantity of copper. At about that depth, however, great bodies of oxisulphurates and erubescite were met with in the Anaconda, from which, in the early days, ores running 50 per cent. copper and over were mined by tens of thousands of tons. Subsequently, the Mountain View commenced to yield from about the same depth the rich decomposed ores which are now assisting the large product of the Boston and Montana Copper Company. The same oxisulphurates come to the surface, or are found near the surface, where the lode crops out in the valleys and on the flanks of the hill, but their depth and richness there are not as great as on the summit. Here it would seem as if the copper, leached out of the 400 feet of depleted vein, had been concentrated in the underlying ore, and had thus produced a zone of secondary ore about 200 feet deep, which contains, as might be expected, about thrice its normal copper contents. In the decuprified surface ore, silver was retained as an insoluble chloride when the soluble copper was removed. Therefore we find that the proportion of silver to copper is less in the enriched copper zone, where an excess of copper is added to the normal silver contents, than in the unaltered ore beneath. Hence, the proportion of silver to copper increases with the depth. The Anaconda was bought as a silver mine, and preparations were being made to mill the ore when the shaft entered the copper. The experience of the Parrott and other mines confirms the theoretical anticipation that the lean unaltered ores carry a larger proportion of silver to copper than the overlying altered ores. No massive carbonates have been discovered, but the Gagnon and Parrott in their early days yielded small quantities of an earthy carbonate of copper, rich in silver. The altered ores of both the great lode and the smaller cross and parallel lodes consist mainly of a compact purple ore and of soft black ore with a bright metallic streak.

The actual copper yield of the Boston and Montana is given in the report of the company for the year ending June 30, 1890, at 9.36 per cent. This high percentage is the result of treating a very large proportion of the rich altered ore. Distributing the published yield of the Anaconda and the Chambers Syndicate mines over the number of tons said to have been transported from the mine to the smelting works—namely, 61,647,000 pounds of copper over 1,028,000,000 pounds of ore—we obtain, as the yield of the Anaconda, whose reserves of altered ore are not yet exhausted, 5.9 per cent.

The ultimate yield of the deep copper ores of the great Butte lode and its subordinate veins will undoubtedly be lower still. Many small copper mines are being worked on the parallel veins, and on what appear to be spurs of the great lode. The operators are the Chambers Syndicate, a company closely connected with the Anaconda; the Boston and Montana Company, the Butte and Boston Company and a number of individual owners. Some of the ore bodies of these subordinate lodes are large and their ores generally carry a profitable percentage of silver. In the aggregate they add largely to the present production of Butte, and, considering the great length of ground which they represent, they insure for Butte a longer life than would be its lot if all the companies were making their extravagant drafts on the one great lode alone.

Both Arizona and Montana have increased their production from year to year, but in very different proportions, as the following figures, from "The Mineral Resources of the United States," show:

	Arizona.	Montana.
	Pounds.	Pounds.
1882.	17,984,415	9,058,284
1883.	23,874,963	24,664,346
1884.	26,734,345	40,612,783
1885.	22,706,366	61,797,864
1886.	15,657,035	57,611,621
1888.	31,797,300	97,897,968
1889.	31,800,000	104,200,000

(To be continued.)

PROVIDENCE ENGINES IN ELECTRIC RAILWAY WORK.

Last year the output of the Armington & Sims Engine Company of Providence, R. I., as nearly as can be estimated, was 30,000 horse-power, of which amount 20,000 horse-power was for electrical railway use with the overhead trolley system. A recent issue of the *Electrical World* in an article on "Statistics of Electric Lighting in Massachusetts," says: "The total number of boilers in use in central stations was 200, which furnish power to 250 engines." The books of the Armington & Sims Engine Company show a shipment of engines for electrical purposes only for the State of Massachusetts of 267 engines. In this number are not included those placed on board steamers that sail from any ports in Massachusetts, neither does it include engines used for manufacturing purposes. The article referred to states that the Edison Company of Boston leads the list in incandescents with 25,600 lights of 16-candle power, supplied from 77 dynamos. In this station there are 24 Armington & Sims engines of 150 horse-power each. Four of them are now worked up to 200 horse-power each. They supply 800 horse-power to the West End Street Railway Company.

The works have just received an additional order for five of these engines which are to be used for the same purpose as those just mentioned, and will without doubt give 1000 horse-power additional, or 1800 horse-power in all. There are, independent of this station, four Armington & Sims engines, owned by the West End Company, which are located at Allston and are understood to be developing 300 horse-power each. From this it may be estimated that the output of both stations for the West End road will be 3000 horse-power. It seems to be still an open question whether the direct acting, single expansion or compound high-speed engines are preferable to the long-stroke, low-speed, triple expansion engine, and American practice may vary according to individual preferences in this regard for years to come.

Cars heated by steam now run out from New York on the New Haven railroad, which is a result of the tunnel accident.

Hydraulic Operating Screws for Blooming Mill.

The accompanying drawings show an arrangement invented by Henry Aiken of Pittsburgh, Pa., by means of which the adjustment of the rolls, whether two or three high, can be easily and quickly effected. The rolls are mounted in the usual manner in the housings, as shown in the drawings, Figs. 1, 2 and 3, the journal boxes of the lower rolls resting on the bottom of the windows in the housings, while the journal boxes of the upper roll are supported by rods extending upwardly from the crossheads on the piston rods of fluid pressure cylinders. These cylinders are connected to an accumulator, thereby providing a yielding support for the upper roll. Through the upper portions of the housings above the windows are formed threaded openings for the reception of screws, whose lower ends bear upon the upper halves of the journal boxes of the upper roll, as shown in Fig. 1. On the upper ends of these screws are held pinions in such a manner as to permit the screws to move longitudinally through them, while at the same time rotating. These pinions engage with a large gear wheel arranged between them and which is keyed to a vertical shaft mounted in suitable bearings in a frame screwed to brackets attached to the inner faces of the housings. On this shaft is also keyed a pinion intermeshing with a rack bar connecting the pistons of two single-acting fluid pressure cylinders, the arrangement being as shown

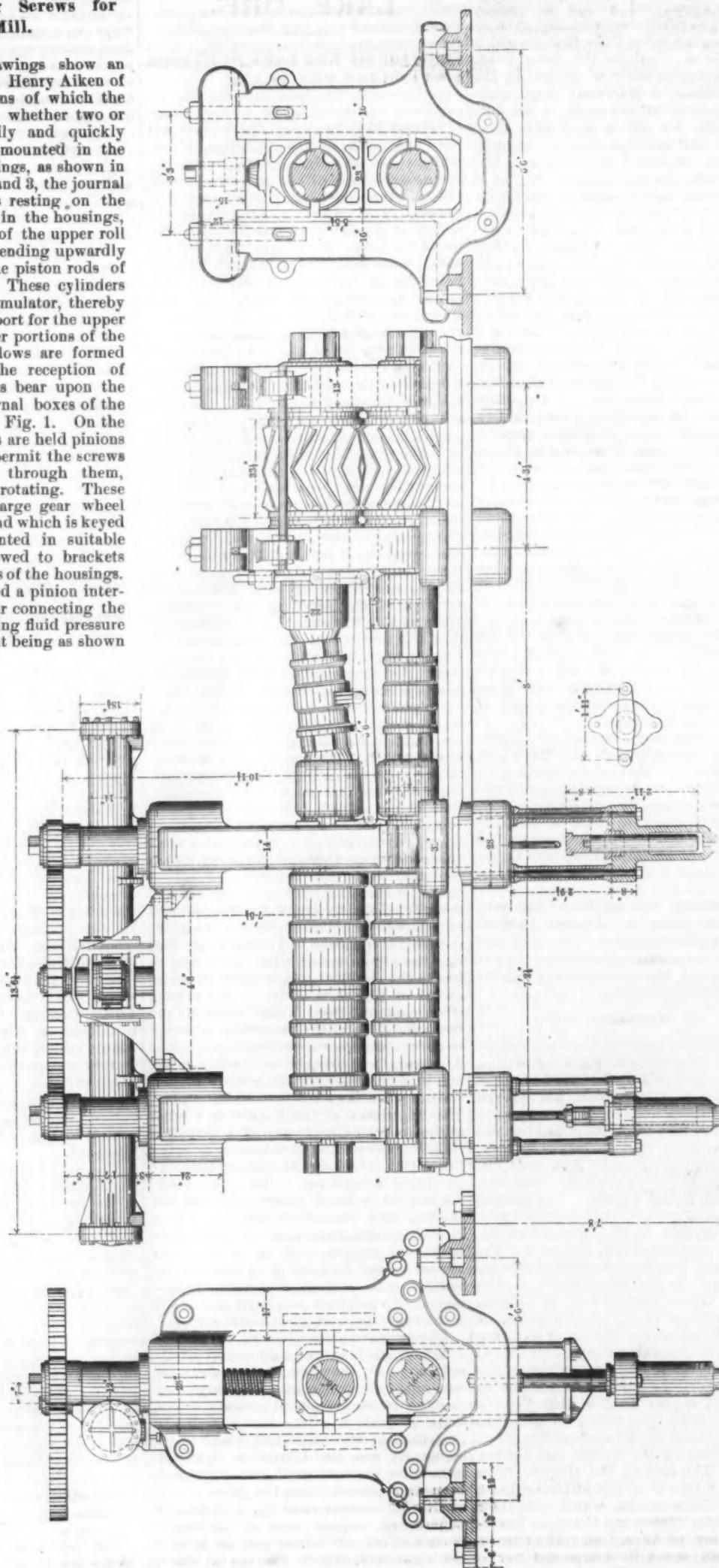


Fig. 1.—End Elevation.

Fig. 2.—Side Elevation.

Fig. 3.—End Elevation.

HYDRAULIC OPERATING SCREWS FOR BLOOMING MILL.

in Fig 4. These cylinders are secured on the housings, and are so placed that by admitting fluid pressure into one of them while the exhaust is taking place from the other the rack can be shifted longitudinally and the screws rotated as desired. While Mr. Aiken prefers to employ single acting cylinders formed independently of each other with their inner adjacent ends open, as in this construction (the amount of packing required is reduced to a minimum, the pistons being the only portions requiring a packing), it is evident that one double-acting cylinder may be employed if desired. In order to carry out this idea the cylinders are formed integral with each other, thereby constituting a single cylinder, provided about midway its length with an opening through which the pinion projects, so as to engage the rack bar, this bar being so formed and provided with a suitable packing at its ends as to serve as pistons. It will be observed that the two single-acting cylinders, having their pistons rigidly connected, really operate as a double-acting cylinder. One of these machines is now being made

LAKE ORE.

POSITION OF THE LAKE SUPERIOR IRON ORE TRADE.

The ore situation at Cleveland is clouded with uncertainty in some respects, but in others it is very well defined. The uncertainty prevails with regard to the time when heavy buying will begin and the quantity of ore which will be needed to supply the year's requirements. The facts thus far settled are that prices will be at least 20 per cent. lower than the prevailing rates last year and that the output will show a heavy reduction on last year's enormous figures.

1890 and 1891 Compared.

A more complete reversal of the condition of affairs, as compared with the spring of 1890, could hardly be conceived. At that time contracts had not only been made for more ore by far than had ever before been produced in one year from the Lake Superior mines, but the demand for

nevertheless that consumers of ore overestimated their needs quite considerably. That the mining companies were not responsible for the great overproduction of ore is shown by the statement that only about 1,250,000 tons of the stocks referred to were unsold out of the entire quantity so held on December 1.

Stock of Bessemer Ore.

A curious fact in connection with the unsold ore is that more of it was Bessemer than non-Bessemer, showing that there had been more than enough Bessemer ore to go round, despite the fears of a Bessemer ore famine early in the season. The large stocks of ore at the lower lake ports are much in excess of any previous stocks at this time of the year, and some of the docks are in such condition that no more ore can be received by them. At a few docks an additional supply can be handled, but it is safe to say that shipments to furnaces must be quite generally resumed all along the line before lake shipments can begin in earnest. This will depend upon the resumption of activity by the Ohio and Western Pennsylvania

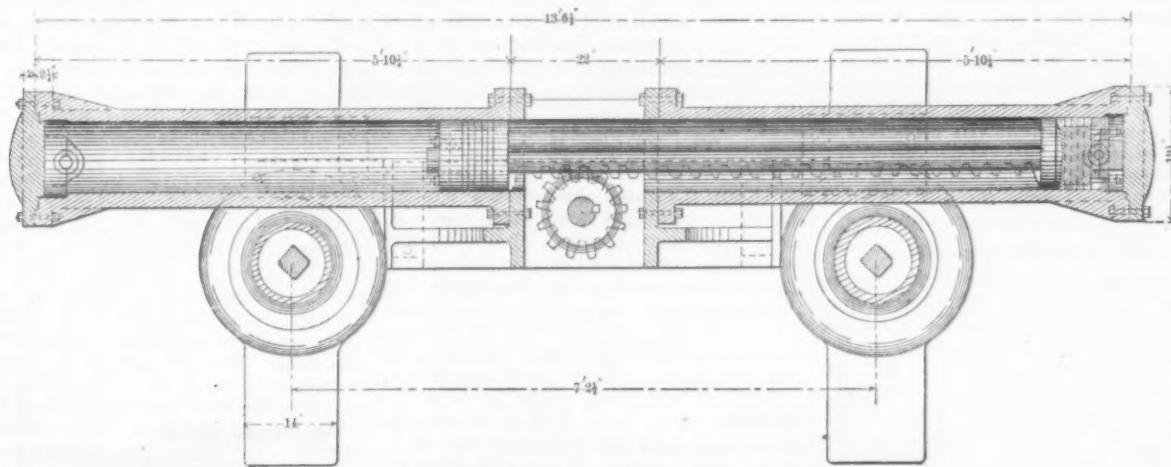


Fig. 4.—Sectional Plan Through Hydraulic Cylinders.

for the Cleveland Rolling Mill Company of Cleveland, Ohio, by William Tod & Co. of Youngstown, Ohio.

Ramie Cultivation.—John S. Williams, an engineer who went to Mexico to assist in the erection of new process ramie machinery on the estate of General Pacheco, brings home accounts of a prospective revolution in the textile world, the plant being wonderfully productive and adapted to the manufacture of a great variety of products. He says the supply of ramie is inexhaustible, as there are millions of idle acres of it throughout Mexico. At least 40,000 stocks can be planted to the acre, and the yield will be from 40,000 to 60,000 pounds in ribbons. The "ribbon" is really the bark. The size of the plant is from $\frac{1}{4}$ inch to $\frac{1}{2}$ inch in diameter. It takes about 90 days' growth before the plant is fully matured, and from two to four crops of ramie can be gathered every year. The bark will produce about 60,000 pounds of dry fiber to each acre, worth at least six cents per pound. One man can plant from three-quarters to an acre per day, and at the end of 90 or 100 days at furthest he can begin to reap. After the ramie has been planted it needs but very little attention, and when the planter begins to reap he can somewhat vary the order of things by planting one day and reaping the next, climate permitting, of course.

Proposals for postal sea service under the new Subsidy act will be expected not later than June.

Bessemer ores especially seemed to be greater than the supply, and a Bessemer ore famine was seriously discussed. So far removed from any uncertainty about disposing of their output were the mining companies that not a few of them had oversold their capacity before the shipping season began. Furnace owners who made contracts for ore earliest were the most fortunate, as prices steadily hardened as long as purchasers were in the market. Under the circumstances it is rather remarkable that prices did not go much higher. This would surely have been the case but for the opening of new and very productive mines within the preceding year or two, as well as the admirable preparations made by mine managers to meet an extraordinary demand.

Stock of Ore.

The conditions prevailing in the ore trade at present are peculiar, a new set of problems having arisen which require solution. Among these are first the large stocks of ore now on the receiving docks at lower lake ports. On December 1 last, these stocks aggregated at all ports 3,900,000 tons in round numbers, or over 40 per cent. of the aggregate production of the Lake Superior mines in 1890. It is asserted by those in a position to form a close estimate that these stocks have not been largely reduced during the winter months and that May 1 will see over 3,000,000 tons still waiting to be forwarded to furnaces. The stoppage of the Mahoning and Shenango Valley furnaces and the coke strike have, of course, had much to do with the retention of the ore at the receiving docks, but the fact is apparent

furnaces, the owners of which are not only waiting for the termination of the coke strike, but also for the adjustment on a lower basis of freight rates on coke. The Mahoning and Shenango Valley furnace owners held a meeting the past week to discuss the situation, and are reported to have stood as firmly as ever against resuming operations until they secure the concessions for which they shut down in the first place.

Southern Competition.

Another question which is a potent factor in determining the course of the lake ore trade is the encroachment of Southern pig iron in the markets which naturally belong to the furnaces running on lake ore. The Lake Superior mining companies find their interests identical with those of their customers, the Northern furnace men, and some of them go so far as to say that a new adjustment of values is conceded to be necessary in order to assist their customers to regaining complete control of the territory north of the Ohio River. To reduce the cost of pig iron to \$13 or under they are prepared to mark down the price of ore, expecting at the same time to have the co operation of vessel owners, the railroad companies hauling from mines to shipping ports, ore trimmers, manufacturers of coke, railroads hauling coke, &c. It is understood that no demands for a reduction in freight rates are being made on the railroads running from lower lake ports to furnaces. Their rates are regarded as already sufficiently low. Although matters have not progressed far enough to permit a definite statement to be made of the intentions of certain furnace companies, it

is known that as soon as they have secured the reductions now deemed certain on ores, coke and freight an aggressive policy will be inaugurated for the renewed control of Northern markets.

Financial Position of the Mines.

Those who may be expecting to get very cheap ores, however, as they did in 1888, when the ore market was glutted, are probably destined to be disappointed. The mining interests of the Lake Superior region are much stronger financially than ever before, and there are no hypothecated ones to be forced on the market. The collapse of the Gogebic boom was largely responsible for the financial sales of 1888. No such condition of affairs prevails now. Whatever apprehension might have existed with regard to the Schlesinger group of mines has been completely removed by their passing into strong hands and under most able management. Relieved from any financial pressure, no property can be so easily adjusted to changing conditions of business as a mine. The Lake Superior mine owners propose to regulate their output this year according to the requirements of the trade. The large companies particularly will be very conservative in endeavoring to make sales. The ore companies state that they not only had no trouble in enforcing contracts with furnacemen when the market sagged last fall and winter, but that payments have been made promptly and regularly according to the settled terms, and that the ore on the docks at lower lake ports classed as sold is thus nearly all paid for, and will not have to be resold at a bargain price.

This Year's Production.

The estimates of the production of ore this year in the Lake Superior region range in the neighborhood of 6,000,000 tons. A few of the Cleveland ore dealers think these figures will be exceeded, but others who have close affiliations with iron interests and reason from a slightly different standpoint think that 6,000,000 tons will hardly be reached. In view of the very heavy stocks carried over from last year, which was a period of enormous pig iron production, it seems not unlikely that the output of ore may shrink to 5,000,000 tons this year with the iron trade in such a depressed condition. The mining companies will certainly have no inducement during the early part of the season to hurry shipments. A small production of ore this year was, in fact, laid out by the large producers at the close of navigation. They cut down their working force from one-third to one-half, and the number of miners is not being increased as usual with the approach of the shipping season. For instance, one mine in Northern Michigan which usually employs 2000 men is now working but 1000. Another company, which employed 1800 men in November, cut the force to 1100 afterward. Many small mines have been shut down entirely, because their owners see no profit in the business, and do not propose to exhaust their deposits and waste their property merely to be known in the trade. Stock piles at the mines are very small compared with the enormous mounds ready for shipment at this time last year.

Sales of Ore.

The sales made thus far are very light, perhaps falling considerably short of 1,000,000 tons. None of the large consumers of Bessemer ores have yet entered the market and are not expected for some time, as they are known to have good stocks carried over from last year. The few buyers are principally independent furnacemen who recall previous experiences of this kind and think it is well to buy when they can supply themselves at fairly low prices. They have bought Bessemer hematites at \$4.50 to \$5, Bessemer hard ores at \$5 to \$5.50 and non-

Bessemer ores at \$4.10 to \$4.25. These prices are from \$1 to \$1.25 lower than the prices of March, 1890. The sales here referred to were made from a month to six weeks back, but since then inquiries have in but few cases led to actual transactions. A feature of the sales referred to is that the buyers were men who are somewhat acquainted with mining or interested in mines and who either knew about what it costs to produce ore or else preferred to buy rather than exhaust their own deposits without profit. From the nature of large inquiries made it seems to be quite apparent that a number of furnaces using mainly Bessemer ores last year will consume non-Bessemers largely this year and turn their attention to the foundry trade. This is in the line of what was referred to above in connection with the question of Southern competition. A buying movement in that direction may set in early if the coke strike is settled. The opinion is quite generally expressed that in most instances furnace-men will buy from hand to mouth instead of making season contracts, in which case there is likely to be a period of very great activity in the fall after crop prospects are settled. History would merely repeat itself if the winter of 1891-2 should set in with many furnaces short of ore because contracts were not placed early enough for the ore to be mined and shipped during the season.

The Eastern Demand.

The Eastern demand for lake ore is in about the same state as the Western demand. Inquiries have been received, and hopes are expressed that the lower prices now ruling for ore may enlarge the Eastern consumption very materially, but furnacemen will be slow to make contracts while the iron market is so depressed. The great obstacle to a large Eastern consumption is the high cost of transportation, but efforts are being made to have the rail rate reduced from Buffalo to the furnaces, and with the reduction assured in vessel rates a saving of some 60 cents per ton is likely to be made, which should help materially in increasing this branch of the trade.

Reductions in Freight Rates.

Transportation matters are as yet unadjusted for the season. The mining companies are endeavoring to secure reductions on both the rail haul from mines to shipping docks and the vessel haul to lower lake ports. They claim that 45 cents per ton is entirely too much for a 12-mile rail haul, as, for instance, from Ishpeming to Marquette, and that 70 cents is too much for 39 miles, from the Gogebic mines to Ashland. These charges, it is claimed, are among those to be pruned down in order to put Ohio and Western Pennsylvania blast furnaces in a position to hold their own with Southern furnaces. Even 10 to 15 cents per ton is a saving not to be despised, and the mining companies are trying to get it.

Lake Freights.

Lake freights are so far from settlement that hardly a charter has yet been made. The companies are unwilling to pay more than \$1 to the head of the lakes, while the vesselmen hold out for \$1.10. In any event, it seems now very unlikely that ore will begin to be received at lower lake ports before the 1st of June, as the Cleveland vessel owners have agreed not to start their boats out before the 15th of May on account of the restricted business to be done this season. The mining companies owning vessels will co-operate by holding back their own boats until then, believing that it will be to the advantage of the ore trade to have a late opening. Vesselmen at other ports are not as yet signing the agreement with the Cleveland vesselmen, but the ore companies assert that they will not

load vessels from any port until the middle of May. Owners of vessels will have some compensation for their idleness during the first six weeks of the season in the rebate on their insurance, which amounts to 10 per cent. for April and 5 per cent. for two weeks of May, or 15 per cent. in all, which is perhaps more than they would clear in carrying ore in the same time.

The principal work on the Erie Canal by the State Engineer last year was the continuation of the lock lengthening, in accordance with the policy adopted by the Legislature of increasing to twice the present length one of each of the twin locks so as to pass without delay, at one operation, two boats fastened together.

The Forter Hydraulic Ladle Crane.

The accompanying drawing shows a crane invented by Samuel Forter of Pittsburgh, and especially designed for use in mills and furnace plants where heavy burdens have to be lifted and transported from one place to another, as, for instance, for ladle cranes in Bessemer or open-hearth steel plants. The load lifted by such cranes is generally very great, and it is desirable that the crane should be very strong and yet as light as possible consistent with the requisite strength, and that the power in operating the cranes should be as small as possible.

With such ends in view, the crane shown in the accompanying cut has been designed. It consists of a very light mast, a step-casting attached at its bottom and a hydraulic cylinder at the top. The jib in this crane is a rocking beam and is pivotally supported by means of a strut leading from the foot of the mast and brace-rods leading to the upper portion of the mast. The rear end of the jib is connected by links to the crownhead of the plunger; the outer end is provided with a frame formed into hooks at the lower end to receive the ladle. The cylinder receives the water through the top trunnion. The plunger moves downward when the load is to be lifted.

The braces and jibs of the hydraulic cranes commonly used for steel and iron mills are connected to the mast at points intermediate between the top and bottom bearing and therefore require the mast to be made of very heavy beams or castings in order to withstand the great bending strain to which it is subjected.

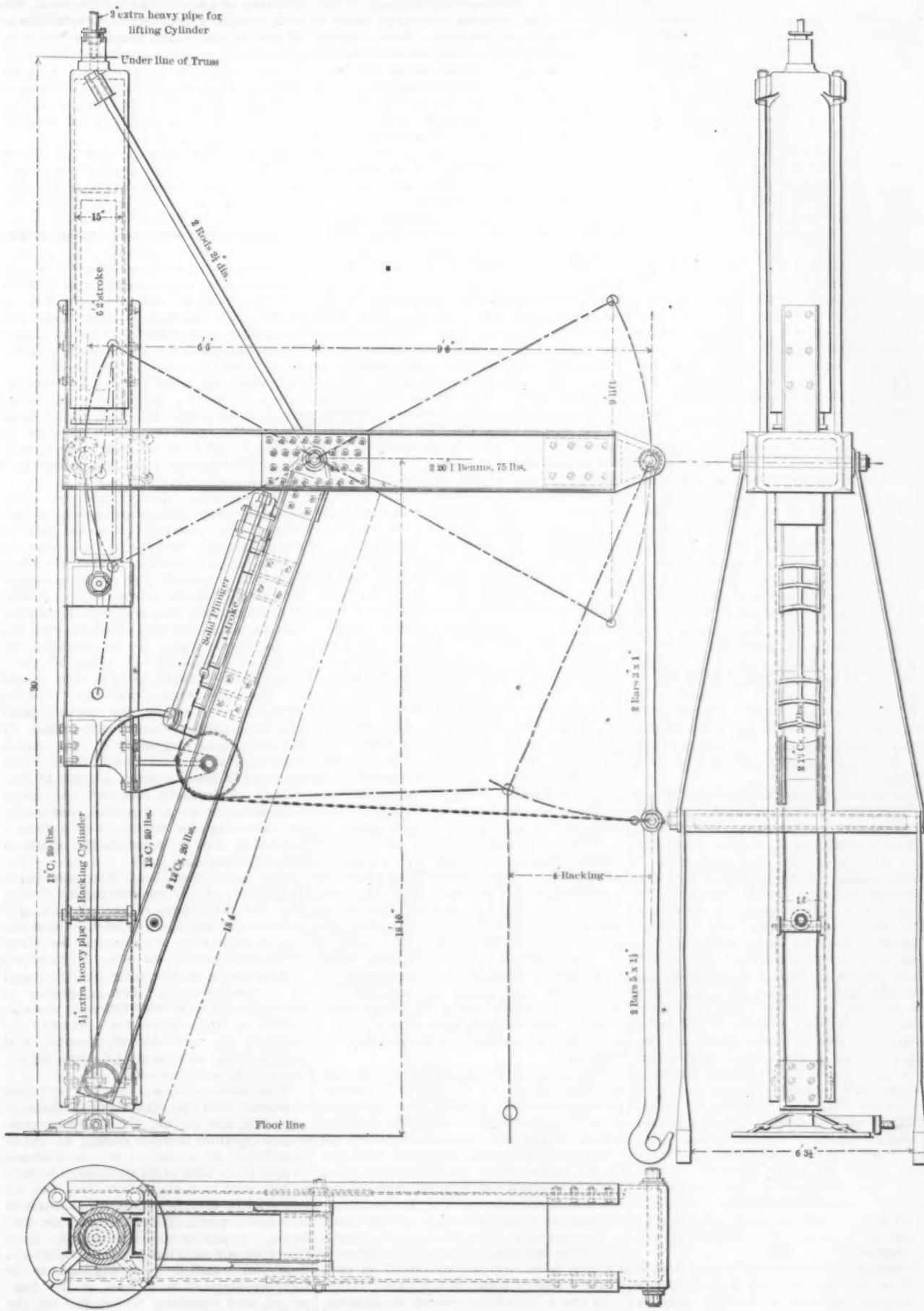
It will be noticed that the strut which extends from the foot of the mast to the pivotal point of the jib is connected with the mast in such a manner that the center line intersects the center line of the mast at or near the middle of the bearing. The same is the case with the brace rods extending from the top of the mast. The consequence of this construction is that strains on the mast tending to bend it are avoided and that the mast can be constructed very light. The vertical downward thrust resulting from the brace rods is counteracted by the upward pressure of the cylinder, thus creating a tensile strain in the mast. A great deal of power is consumed in ordinary cranes by the friction of the rollers or shoes traveling along the mast the full length of the stroke, as in cranes of the Wellman type, or by the heavy side thrust in the stuffing box top-steadment in Holley cranes. Moreover, the dead load is in most cases very large in proportion to the net load. This, of course, necessitates a plunger largely in excess of the one needed to lift only the net load, resulting in a great waste of power.

In the Forter crane the only friction is the journal friction of the jib beam pivot and the stuffing box friction of the cylinder, which is very small, as the stuffing box has no appreciable side thrust to sus-

tain. As the plunger moves in the opposite direction to the load, this crane can be either entirely or partly balanced. It will, of course, be best to balance it so that the dead load is just sufficient to overcome

horizontally. A rocking cylinder can be attached to the strut, as shown in the cut. It is a single-acting cylinder, the plunger of which is connected at its top to two chains leading around chain wheels

ward the mast. The gravity of the load always tends to bring it back to the extreme point. The plunger is solid, in order that its weight will overcome the back pressure in the cylinder.



THE FORTER HYDRAULIC LADLE CRANE.

the back pressure in the cylinder, thus allowing the front end of the jib to descend when the net load is taken off.

It is desirable to rock the load also

to the ladle hanger. The water for this cylinder is introduced through the bottom trunnion of the crane. When the plunger is pressed upward the load is pulled to-

The dot and dash lines show the movement of the jib and its operating plunger, and also the movement of the hooks carrying the load.

The Calculation of Blast-Furnace Slags.—I.

BY A. J. ROSSI, NEW YORK.

There have appeared in *The Iron Age* within the last two months several articles on the calculation of blast-furnace slags, and in the issue of January 22, 1891, reference is made to certain papers on this subject which have been read before the American Chemical Society and published in its journal (Vol. XII, Nos. 6 and 8, A. Braneman, 97 Water street). This question, of great importance at all times, has assumed at once, it would seem, a real actuality, if I am to judge from the numerous letters I have received from this country, and even from England, soliciting information as to the aforesaid papers. I have thought that a condensed remodeling of these articles, stating their general purpose and scope and developing from them more specially that part which treats of calculation of slags, might prove of some interest to your readers.

The experiments of Caron, Berthier, Ebelmen, Percy and many others on the fusibility of silicates have established the fact that, excepting the alkaline silicates of potash and soda, which are all fusible, the single silicates of earthy bases—that is, the silicates of one base only—were either absolutely refractory, such as aluminum and magnesium silicate (fire clay and serpentine) and most of the calcium silicates, or only fusible at the highest temperature attainable in a blast furnace; practically, only one combination of lime and silica is really fusible. The word "fusible," as understood by the authorities quoted, implies the idea of an extreme limit which it is possible to reach in a blast furnace, but which, practically, it would not be always safe to attain and specially to depend upon. It is not sufficient, indeed, that a slag should melt when it reaches the zone of the tuyeres; it must not run pasty nor thicken; it must still preserve a certain fluidity when it comes into contact with the fore part of the crucible or with the air.

Double and, in general, multiple silicates are considerably more fusible than any single silicate, and, other things being equal, a silicate melts more readily when the silica it contains is combined with a greater number of different bases. A triple silicate is thus more fusible than a double silicate. Blast-furnace slags are essentially triple silicates of alumina, lime and magnesia and, more properly, polybasic silicates, containing beside these three oxides named oxides of iron and magnesia and even alkalies in very important quantities of 5 per cent. and 10 per cent. and even more. For a single silicate, as well as for a silicate of two or more bases—for instance, for one of lime—there may be different saturations of the silica by the basic element; that is to say, different quantities of lime for the same quantity of silica, which correspond in each case to a greater or lesser fusibility. Blast-furnace practice as well as direct experiments have shown that the more basic a silicate (meaning in this case not the number of the bases combined with the silica, but the amount of basic elements as compared to that of the silica) the less fusible was the compound, as a rule.

When the composition of a slag, resulting from the charging into a blast furnace at regular intervals of certain relative quantities of ores, fluxes and fuel, assumes this more basic character mentioned above, the temperature required to melt it must necessarily be higher; and these conditions of greater heat in the furnace correspond in a general manner to the production of an iron richer in graphitic carbon and silicon—in other words, of an iron affecting

the darker shades of gray. It may be said then that, as a silicate becomes more and more basic, thereby less and less fusible, the grayer are likely to be the grades of iron accompanying it; and, inversely, the more acid or less basic it is the more fusible it becomes, within certain limits, and the greater is the tendency of the pig metal to be mottled or even white. In the papers mentioned I have quoted numerous analyses of blast-furnace slags (70 in all), stating the grades of iron accompanying them and comparing their fusibility with that of silicates of composition made *a priori* and experimented upon directly by various authorities with the view to corroborate the preceding assertion as to relations between fusibility and basicity, opinions now quite generally accepted.

It is obvious that, in a multiple silicate in which the total of the different basic elements represents a certain saturation of the silica, all these bases could be replaced (so far as such saturation is concerned at least) by such a quantity of any of them, lime for instance, that this quantity of this one base would saturate the silica in the hypothetical silicate thus obtained in exactly the same manner as it was in the original compound by all the different bases. The various denominations under which the different saturations of the acid element, the silica, by the bases, may be known, have nothing to do with the preceding observations. It is immaterial in this respect if, adopting the existence of hypothetical radicals, as is done sometimes in the most modern conceptions of the constitution of this class of compounds, the different saturations of one of the elements have been called mono, sesqui, di or tri silicates, according as the proportions of acid, the silica, construed with the base were 1, 1½, 2 or 3 of silica; or, if adopting another nomenclature, and one better known and more generally found in metallurgical books, the different compounds have been called monobasic or neutral, sesquibasic, bibasic, tribasic, and even sesquiacid and acid, according as the proportions of the basic element to 1 of acid were, as the words indicate: 1 of base to 1 of acid, 1½ of base to 1 of acid, or 3 of base to 2 of acid, 2 of base to 1 of acid, 3 of base to 1 of acid, or 1½ acid to 1 of base, equivalent to 3 of acid to 2 of base, or finally, 2 of acid to 1 of base.

There is in the silicates one feature which remains the same by whichever name we may choose to call them, whatever nomenclature be adopted; it is that one which is furnished at once and directly by the analysis, the ratio of the oxygen of the silica to that of the bases. This ratio is the characteristic point of a silicate under examination, of its state of saturation; it stamps, so to speak, its individuality among a certain class of compounds, making it perfectly distinct from all others in certain properties, such as fusibility, for instance.

This ratio of the oxygen of the silica to the total oxygen of all the bases corresponds to a certain quantity of silica and to a certain quantity of each of the different bases. Using the chemical symbols for these bases and silica, this ratio can readily be ascertained. It is obvious, also, that the quantity of oxygen representing the sum of the oxygen of all the bases corresponds to a certain weight of an oxide of a single basic element, oxide so calculated that its oxygen would be equal to the sum of the oxygen contained in each of the different basic constituents.

In short, a multiple silicate of alumina, magnesia, lime, oxide of iron, oxide of manganese, potash, &c., containing known percentages of each of these bases, as far as saturation for silica is concerned, as far consequently as the ratio of oxygen of the silica to that of the bases, is equivalent as type, in fusibility, to a silicate of a single base in which the quantity of silica

has remained the same as in the original compound, and in which the oxygen of that one base into which all the others have been transformed is equal to the oxygen of all the other oxides or bases. Taken together these quantities of silica and that one base, lime for instance, furnish always a percentage composition in silica and lime which can be tabulated as corresponding to a certain denomination in any nomenclature adopted, or, more broadly and generally, as corresponding to a certain saturation, implying a certain fusibility and the idea of the production of a certain grade of iron.

If, then, discarding all symbols, formulæ, all hypotheses or conception of any kind as to the composition of these complex compounds, I record in a table the percentage composition of different types of silicates, expressed and transformed in silica and lime, placing under each the saturation of silica by lime or *vice versa* resulting from such composition, stating also the fusibility and grade of iron to which they correspond. Any person not necessarily competent in technical chemistry will be able by a simple calculation to compare any slag actually made or to be made and transformed also into its equivalent in lime and silica, whatever its composition might be, with one of these types. He may pronounce at once as to the fusibility of the slag, as well as to the probable character of the grade of iron likely to accompany it.

The fusibility of a silicate has been observed to be dependent upon its basicity up to a certain point and then to diminish again directly as its acidity increases beyond a certain figure; but these questions are entirely of observation and such as only direct experiments or results of practice could have and have elucidated; they do not in any way interfere with the preceding reasoning. In establishing the tables of fusibility of types as given below I have taken as basis the results of the researches and the received opinions of well-known metallurgists and have tried to corroborate them by the deductions suggested by the critical examination of 70 different slags made here and in Europe under all sorts of conditions of furnaces, hot and cold blast, with different fuels, charcoal, anthracite or coke—slags for which, in each case, I have been able to ascertain the grade of iron accompanying them.

The amount of magnesia, alumina—in general, of any metallic oxide entering into the composition of any given slag—corresponds then, as explained, to so much lime as basic element saturating the silica to the same extent and manner in which it is saturated in the original compound by the sundry bases. The calculation of the equivalences of the different metallic oxides in lime does not present any difficulty for a technical chemist, and such a table as Table II, given below, can readily be established.

Thus eliminating all that can be called technical, using no symbols or formulæ of any kind, and calling the different substances by their familiar names, we are in possession of a table of equivalence (Table II) in lime of all such bases as may be met with in a slag or in ores, and we can readily transform any given analysis into one in which silica and lime alone will figure. It will be sufficient to take from the table, for each base, its equivalence in lime and multiply its equivalence by the percentage of such base in the compound, and repeating for each base the same operation, to add together all the amounts of lime thus found. This total, with the amount of silica which has not been changed, will furnish a percentage composition. Comparing the composition thus obtained with the types tabulated (Table I), it will be possible to find readily how near to any of them, or be-

tween which of them, the slag considered and transformed as explained does fall. Consequently, it will be possible to judge very closely of its probable fusibility and of the grade of iron likely to accompany it.

Before proceeding any further, and to render perfectly clear the principle of construction of these Tables I and II, it may be advisable to illustrate it by an example. For instance, using the most modern atomic conception of silicates, suppose that we have to deal with a monosilicate derived from metasilicic acid, $H_2SiO_4 = H_2SiO_3 + O$, in which H_2 is replaced by Ca , furnishing us with the calcium monosilicate metasilicic, $CaO \cdot SiO_2$ or $Ca \cdot SiO_3$. It will be observed at once that 1 of CaO saturates 1 of SiO_2 ; oxygen of acid 2 = oxygen of base 1 \times 2, oxygen ratio = 2:1. Calculated by using either the equivalent

mottled and white. This typical composition consequently appears in the table under the different technical denominations under which it may be known (for reference); its oxygen ratio is also given; but practically, and discarding all theoretical considerations or formulæ, the slag or silicate which, transformed into lime and silica, will have this composition or one very close to it, can be taken as likely to have the same fusibility in a blast furnace as that of the hypothetical type of silicate to which it approximates in analysis (but not of this special compound, $CaO \cdot SiO_2$), and consequently to run with the same grade of iron.

As to table of equivalences (Table II), its construction is of the simplest kind. Using indifferently the denominations,

will be to lime, as far as saturation for silica, as the equivalent or atomic weight of such base RO is to the equivalent or atomic weight of lime, CaO . As regards bases of the form R_2O_3 , it is easy to see that if 1 of R_2O_3 , say alumina, Al_2O_3 , weighing 103, saturates 3 of silica, weighing 180, to the same extent as type, as oxygen ratio of silica to base, as 1 of CaO , lime, weighing 56, saturates 1 of silica, weighing 60—that is, as 3 of lime weighing 168 would saturate $3 \times 60 = 180$ of silica—that, then, 103 alumina = 168 lime, or 1 of alumina = 1.631 lime, as far as saturating silica to the same degree in a compound. All other bases of the form R_2O_3 will thus evidently replace of lime quantities of the latter equal to 1.631 multiplied by the ratio of their equivalent or atomic weight to that of alumina.

Table I.—Types.

CHEMICAL DENOMINATION.

No. 1. Acid. $RO \cdot 2SiO_2$ Disilicates. $H_3Si_2O_6 = H_2O \cdot 2SiO_2$	No. 2. Sesquicid. $2RO \cdot 3SiO_3$ Trisilicates. $H_4Si_3O_8 = 3H_2O \cdot 3SiO_2$	No. 3. Neutral. $RO \cdot SiO_3$ Monosilicates. $H_3SiO_3 = H_2O \cdot SiO_2$	No. 4. Sesquibasic. $3RO \cdot 2SiO_3$ Disilicates. $H_6Si_2O_7 = 3H_2O \cdot 2SiO_2$	No. 5. Bibasic. $2RO \cdot SiO_3$ Monosilicates. $H_4SiO_4 = 2H_2O \cdot SiO_2$	No. 6. Tribasic. $3RO \cdot SiO_3$ Monosilicates. $H_6SiO_6 = 3H_2O \cdot SiO_2$
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OXYGEN RATIO.

O silica : O bases. 4:1	O silica : O bases. 3:1	O silica : O bases. 2:1	O silica : O bases. 4:3	O silica : O bases. 1:1	O silica : O bases. 2:3
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COMPOSITION.

Silica..... 68.19 Lime..... 31.81	Silica..... 61.65 Lime..... 38.35	Silica..... 51.72 Lime..... 48.28	Silica..... 41.66 Lime..... 58.34	Silica..... 34.88 Lime..... 65.12	Silica..... 26.30 Lime..... 73.70
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SATURATION.

1 lime sat.... 2.149 silica 1 silica sat... 0.466 lime	1 lime sat.... 1.607 silica 1 silica sat... 0.622 lime	1 lime sat.... 1.071 silica 1 silica sat... 0.932 lime	1 lime sat.... 0.714 silica 1 silica sat... 1.400 lime	1 lime sat... 0.535 silica 1 silica sat... 1.866 lime	1 lime sat... 0.357 silica 1 silica sat... 2.829 lime
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FUSIBILITY.

Fusible.	Moderately fusible.	Very fusible.	Less fusible than preceding No. 3 V.	Fusible.	Less fusible than No. 5.
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GRADES OF IRON LIKELY TO ACCOMPANY EACH SLAG.

Gray No. 2. Dark shades of gray.	Light shades of gray and even mottled occasionally.	White and occasionally mottled.	Mottled and lighter shades of gray to gray No. 2.	Darker shades of gray, No. 2X, No. 2XX and No. 1 Foundry.	Gray No. 1. Not Scotch pig and Kish cinders.
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Table II.—Equivalence in Lime.

Names of bases and equivalence.	Oxygen in 1 pound of base.	1 pound metal gives in oxide in slag.
1 pound alumina	0.406	1.80 Al_2O_3
1 pound magnesia	0.400	1.66 MgO
1 pound potash	0.394	1.26 KO
1 pound soda	0.903	1.35 Na_2O
1 pound iron oxide (FeO)	0.780	1.29 FeO
1 pound manganese oxide (MnO)	0.780	1.29 MnO
1 pound baryta,	0.365	1.11 BaO
1 pound lithia,	1.866	2.14 Li_2O
1 pound copper oxide (CuO)	0.704	1.26 CuO
1 pound nickel oxide (NiO)	0.747	1.30 NiO
1 pound iron sesquioxide (Fe_2O_3)	1.050	1.49 Fe_2O_3
1 pound chromium sesquioxide	1.100	1.46 Cr_2O_3
	Oxygen in 1 pound silica = 0.533	1 pound silicon gives 2.14 pounds silica.

or atomic weights, this formula, $CaO \cdot SiO_2$, furnishes as the composition :

Silica.....	51.72
Lime.....	48.28
	100.00

Such a compound corresponds to what, according to other nomenclature, would be called a monobasic or neutral silicate. Experience has shown that slags of such character are invariably very fusible, and accompany the lightest grades of iron,

neutral silicate or monosilicate, metasilicic, we know that in such type the oxygen ratio is 2:1, and that consequently the formula is $RO \cdot SiO_2$ for the bases of form RO ; for these of form R_2O_3 , since the oxygen of the silica combined with such base must be double that of this basic element, the formula must necessarily be $R_2O_3 \cdot 2SiO_2$. Hence, as far as saturation for silica is concerned, 1 of base RO takes 1 of silica and 1 of base R_2O_3 , takes 3 of silica. If we adopt lime (CaO), as basis of form RO , each other base, R , O,

should we want to find the equivalence of a base in RO of magnesia, for instance, we should say: Atomic weight of lime = 56; atomic weight of magnesia = 40; 40 magnesia = 56 lime, or 1 magnesia = $56 = \frac{14}{10} = 1.40$ lime.

Let us see now how the Tables I and II can be used in the calculation of a slag. Were the silicate or slag of another type than the one chosen above as example ($RO \cdot SiO_2$)—for instance, were it 2 RO , SiO_2 —the quantity of lime saturating the same amount, 1 of silica, would be different, double in this case of what it was, but evidently the quantities of all the other bases saturating to the same degree as lime the silica being also double of what they were in the first example, $RO \cdot SiO_2$, the equivalence of all bases for this and in general for any saturation remains the same.

The problem, in its greatest generality, can be formulated as follows: Being given different kinds of ores, limestones and fuels of which the complete analyses are known, how must we proportion the quantities of each material so as to obtain a slag of a certain fusibility, corresponding to a certain grade of iron—say a No. 1 or No. 2 xx gray. Referring to the Table I of

types we see that, unless favorable circumstances intervene, we cannot be sure of obtaining such a grade of iron short of a type No. 5. Let the latter be called a bibasic or monosilicate orthosilicic, let the oxygen ratio be whatever it may be, we want to obtain a slag of which the composition transformed into lime and silica will be that of No. 5—that is, silica 34.88, lime 65.12, in which 34.88 pounds lime saturate 65.12 pounds silica; or 1 silica 65.12 saturates 34.88 = 1.866 pounds lime and 1

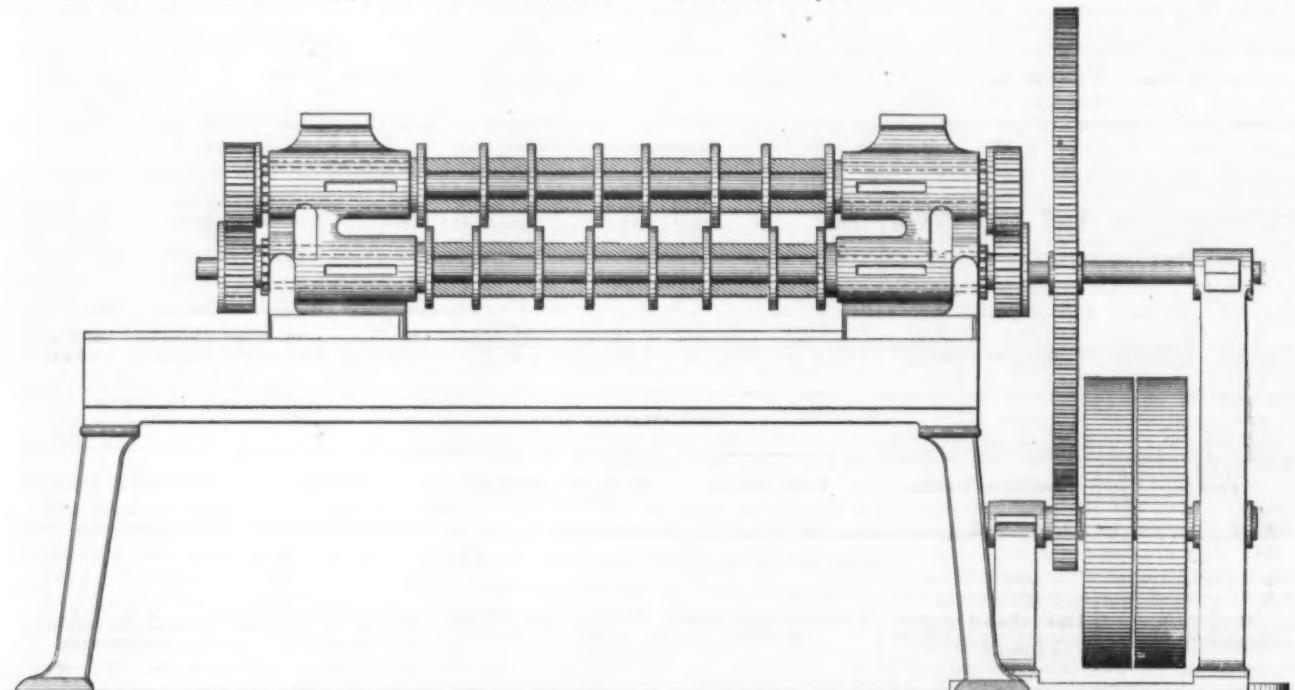
$$\text{pound of lime takes up } \frac{34.88}{65.12} = 0.536 \text{ pound silica.}$$

The mixture of ores depend upon many factors of which the iron master is the best judge. He may be guided, for instance, by the tenure in phosphorus or sulphur so as not to go over a certain average of these elements in the pig, or by their richness in iron, or, still, by their relative cost. Some ores may contain large amount of free silica as quartz, others but small quantities; the use of hematites or brown hematites (limonites), in connection with magnetites is known to be beneficial to the quality of iron; it may prove advantageous to mix together these two kinds of ores. In short, it is a

Gang Slitting Machine.

We illustrate on this page the patent gang slitting machine made by the Trethewey Mfg. Company of Pittsburgh, Pa., which, for adaptability to perform the work for which it is designed deserves more than passing mention. It is stated that the machine works equally well on iron, steel or copper. It consists of a double-head shear with parallel shafts, on which are placed hardened steel disks to take the thrust in cutting. The knives are brought together with a screw wedge. As the knives are reduced in diameter by wear and regrinding they are brought together by eccentrics. The pinions have involute teeth to suit the varying pitch lines. The machine can be made of various lengths to suit the extreme width of sheet which it is desired to cut into strips. As an instance we may mention one designed lately to slit a sheet 24 inches wide, with changes of position of knives to allow the slitting of the sheet into 12 sizes varying in width from $\frac{1}{4}$ inch to 4 inches, the arrangement being so complete as to permit of almost any combination of the different sizes, as well as to slit the whole sheet into strips of any one of the 12 sizes. On the other hand, if a shear is needed to trim sheets, say, 24

both firms in Pittsburgh and elsewhere, and the failure created very little surprise. It has been known in business circles for some months that both firms were cramped for money and were compelled several times to postpone paying their men. During last summer E. M. Butz of the firm went abroad to endeavor to raise \$400,000 on mortgage bonds, but was unsuccessful. Negotiations were also in progress last year looking to the sale of both plants to an English syndicate, but they fell through. The largest creditors of the firms are Boggs & Buhl, dry goods merchants, of Allegheny City, Pa., and they are also the largest individual stockholders. No statement of the financial condition of either concern was made public, but it is understood that the liabilities are considerably in excess of the assets. As before stated, the plant of the Columbia Iron and Steel Company is located at Uniontown, Pa., and was erected in 1886-7, having been put in operation on September 1, 1887. It contains two 5-gross-ton Bessemer converters, two soaking pits, one 32-inch blooming mill, one 28-inch train and one 18 inch train of rolls and four heating furnaces. The product was principally structural shapes, which were finished in the works of the Pennsylvania



GANG SLITTING MACHINE, BUILT BY THE TRETHEWEY MFG. COMPANY.

question which the iron master has to decide guided in each particular case by the circumstances pertaining to it. At any rate it has nothing to do with the present calculations, which will apply just as well to several ores considered individually as entering for a certain fraction each in the total charge of ore, as to an average mixture of the same ores made beforehand.

The Otis Steel Company, Limited, held its third ordinary general meeting in London, England, on the 19 ult. The following report of operations during the preceding year was presented: The net profit of the company was £57,525; to which was added the interest on securities amounting to £3842, making a total of £61,367. After paying interest on debentures, £18,000, and on preference shares, £24,000, there remained £19,368, which, added to the amount carried forward from last account, £1736, made a total of £21,104. Out of this the directors recommend the payment of a dividend of 6 per cent.; this will absorb the sum of £18,000. It is further recommended that £1129 be placed to the reserve fund, and that £1975 be carried forward.

inches wide, on both edges at the same time, the knives can be removed, leaving only a pair at each end of the shaft.

The Columbia Iron and Steel Company.

At a meeting of the Board of Directors of the Columbia Iron and Steel Company of Pittsburgh, held in their offices, on First avenue, in that city, on Friday, 3d inst., it was decided to make an assignment for the benefit of their creditors. Accordingly the legal papers were drawn up and placed on record in the register's office, on the evening of that day, at Uniontown, Pa., where the plant of the firm is located. Christian Yeager, president of the firm, confessed judgment in the sum of \$25,588 to his son-in-law, Rev. John G. Goettman. It is understood that the assignment of the Columbia Iron and Steel Company also includes the Pennsylvania Construction Company, whose plant is also located at Uniontown, both concerns being under the same management. During last week a number of judgments were entered against

Construction Company. The officers are as follows: C. Yeager, president; E. M. Butz, vice-president and treasurer, and R. J. Butz, secretary. A meeting of creditors will be held at an early date, when it is expected that arrangements will be made by which the firms will be enabled to carry on business and keep their plants in operation. They have some very good orders on hand, among which is the contract for the structural material for the new Masonic Building now being erected in Chicago.

The annual report of the Canadian High Commissioner to England, Sir Charles Tupper, has been published, showing that emigration agents are scattered through the United Kingdom and that steamship companies are likewise endeavoring to procure colonists. Nevertheless there was a falling off in 1890 of 20 per cent., from 28,269 the previous year to 22,548. Despite this decline Canada obtained as many emigrants as Australia. It is hoped that the new inducements now offered by the Canadian Government to emigrants who take up land in Manitoba, the Northwest and British Columbia will prove more successful.

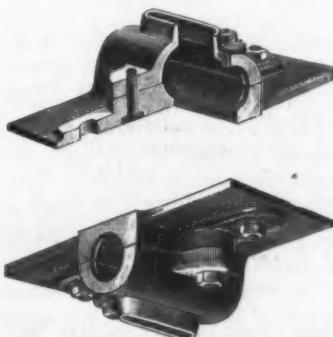
The Great Forge at Cleveland.

It is rather a singular circumstance that a city so far from the seaboard as Cleveland should have the honor of possessing the largest forging works in the country. This distinction is claimed by the Cleveland City Forge and Iron Company, who have more hammers in active use than any other concern, so far as we know. The hammer shops of this company contain 23 hammers in all, of which seven are upright and the others are helve hammers. The heaviest of these hammers has a 10-ton head with an 8-foot stroke. Among the achievements of these works are the manufacture of a shaft 4 feet in diameter on the bearings; plate bending rolls 32 inches in diameter and weighing 64,740 pounds each, and a triple-expansion crank shaft weighing 60,810 pounds. The machine shop connected with these works is equipped with unusually heavy tools for handling the large masses of metal coming from the hammers. One of their lathes, built in Scotland, will take in a shaft 60 feet in length. The demands of machinery builders are running to heavier work continually, for which the facilities of this company are well timed. Recent inquiries for special work surpass in some respects anything previously accomplished. A very large part of the work turned out here is for the shipyards of the country, not only on the lakes but on the seacoast. The company are therefore deeply interested in the movement to build up our merchant marine. Activity in the construction of new vessels means a great deal of work for them in special forgings.

Other specialties of these works are car axles, turnbuckles, car links and pins and car jacks. Turnbuckles of all sizes are made up to 6 inches in inside diameter for cars, bridges and all kinds of structural work. Their facilities for the manufacture of these products are very extensive and complete, and their trade in them extends all over the United States. The entire plant covers 10 acres and is well located for the receipt and shipment of materials and products.

Rigid Journal-Box Castings.

J. W. Foley & Co. of Cincinnati, Ohio, are producing the rigid journal-box casting which is shown in the engravings here presented. It has flat bottom with square holes cast in it for the reception of the bolt head, as shown in the sectional view.



Rigid Journal-Box Castings.

When the boxes are bolted together the bolt heads are thus brought flush with the bottom of the box. The casting itself is light in weight, but possesses ample strength. All sizes are made and carried in stock from 1½ to 8 inches.

Cutlery exports from Sheffield, England, to the United States have fallen off more than one-half under the operation of the new tariff.

THE WEEK.

Artesian wells recently bored in Central America, to which powerful pumps are attached, bring to the surface pure water, which is sold at a good profit to the owners. The strata show a volcanic formation, often hard to penetrate.

Kansas farmers look wistfully at Mexico, where they would like to send 100,000,000 bushels of corn expected from the coming harvest, but the 28 cents duty imposed is prohibitive.

The Iowa Railroad Commissioners in their annual report show that the Iowa railroads carried last year 5,000,000 more tonnage and earned \$8,500,000 more net than the year before. The commissioners add: "A marked and material reduction in freight rates commenced in February and continued through to December. Reductions brought with them the anomalous fact that there has been a gain in the earnings of the year of 8½ per cent. over the year previous."

Outside of her own resources Jamaica makes a poor show at her exhibition of the products and manufactures of the world. Canada is foremost, having made a special endeavor to show that she offers the most tempting market if the islanders desire to build up their foreign commerce. The Canadian contributions, however, are said to be hardly up to the standard. On "American day" Admiral Gherardi and the band from the flagship were present.

The transcontinental railway between Buenos Ayres and Valparaiso lacks only 56 miles of completion, and the tunnel through the Andes will probably be finished during the present year, opening the entire route for traffic.

The Cunard Steamship Company have made a contract with a shipbuilding firm on the Clyde for the construction of two steamships, each of 14,000 tonnage. The new vessels are designed to cross the ocean in five days. They will be nearly 4000 tons larger than the queen of the twin-screw fleet, the City of Paris, which measures 10,499 tons, and will be nearly twice as large as the fastest of the single-screw ships, the Etruria.

Trouble with Italy causes new interest to be felt in the discussion respecting the value of the 100-ton guns, of which Italy has more afloat than any other power. Admiral Scott now places the limit of maximum weight at 30 tons, and Lord Brassey also declares that since such a gun can penetrate 21 inches of armor at 1000 yards, it is "sufficient for all practical purposes."

Commissioner Mason of the Internal Revenue Bureau has given some figures relative to the bounty on sugar. He estimates that not less than \$9,000,000 will be required for the payment of sugar bounties the first year—\$8,000,000 for cane sugar, \$300,000 for beet and sorghum sugar and \$875,000 for maple sugar. This estimate is based on the production of sugar in 1890, and takes no account of the probable increase in consequence of the bounty. The most of the money will go to the Louisiana planters, who produced nineteen twentieths of the cane sugar last year, against 15,000,000 pounds in Texas and 5,000,000 pounds in Florida. Sorghum sugar is produced by six concerns in Kansas, and beet sugar by one mill in Nebraska and two in California. There will shortly be added one beet-sugar factory in California, one in Utah and one in Iowa.

Cheap "free sugar" is expected to bring about a greater demand. H. O. Havemeyer, one of the leading manufacturers, indicated several ways in which this de-

mand would come. He thought for instance that very large jam factories would be started here, as in England, where sugar is free and where a large quantity of jam is produced every year. When the price of sugar is low the consumption of the higher grades is larger. Heretofore 40 per cent. of the whole consumption has been in brown sugar. Candy will be cheaper and will, therefore, be bought more freely. In England the consumption of sugar per capita is 70 pounds, while in the United States it is only 55 pounds, so that the cheapening of the article will inevitably increase its consumption.

Few persons, except those directly connected with the postal service in the United States have a good conception of the magnitude to which it has grown within the last few years. In the number of miles of railway postal routes the United States leads all the world, as shown by statistics just compiled. The combined length of the railway postal routes of the country is 144,557 miles, while the transportation of mails on those routes last year reached the enormous total of 186,575,384 miles. Germany comes next with a total length of 24,522 miles and a total transportation of 89,267,000 miles. But the railways by no means carry all the mails in this country. The star route and steamboat service have a length of 251,792 miles, with a transportation annually of over 12,000,000 miles. To carry on successfully this immense service requires the work of over 90,000 persons. The postal correspondence of the United States with foreign countries falls but a little below that of Germany, which leads the lists of nations. Ninety millions of pieces were dispatched by the United States to foreign countries during the year 1890. The increase over the amount forwarded in 1890 was about 10 per cent. When it is known that of the 90,000,000 pieces forwarded, fully 70,000,000 were carried by vessels of foreign register, the anxiety for some measure by which American mails can be carried by American vessels will be readily understood.

The Union Ferry Company, whose boats cross the East River, own 19 boats, of which 12 are made of wood and seven of iron. The 12 wooden boats cost \$60,000 apiece. Of the seven iron boats the Fulton and Farragut are 15 years old and cost \$65,000 each; the Atlantic and Brooklyn are five years old and cost \$110,000 each; the Pierrepont is two years old and cost \$120,000, and the Montauk and Whitehall are new and cost \$130,000 apiece. The ferry franchise expires May 1.

Advices from Brazil report that the purchase of the entire plant of the Amazon Steam Navigation Company by the Brazilian Corporation Empreza de Obras Públicas has been completed. The purchase price is £850,000, the first installment of which, £100,000, has already been paid in Europe. This transfers from British to Brazilian hands between 80 and 100 river steamers of all sizes, together with all offices, landings, &c., covering the entire basin of the Amazon River and its tributaries, or more than 40,000 miles of fluvial navigation.

There is quite a general movement among the skilled mechanics in Boston hostile to the education of convicts in the various trades. It was initiated by the plumbers' union. A few days ago Governor Russell was waited on by a committee composed of the most influential tradesmen in the city and an address presented protesting against convict trade schools and the Massachusetts reformatory prison at Concord, the principal allegation being that the tendency is to train expert criminals, and they insisted that the "nefarious" system should be abolished.

Cotton manufacturers in the Eastern States feel more and more the competition of cheap labor in the South and the longer hours of work required in that section. Unmindful of this fact, overzealous labor advocates in their appeals to State legislatures seek to impose upon manufacturers new restrictions. In Massachusetts a bill prohibiting the imposition of fines for imperfect weaving has passed both houses and awaits the action of the Governor, and there are three separate bills introduced for the reduction of hours of labor in the mills. The first-named bill takes the management of the mills largely out of the hands of the proprietors, and has the radical defect of reducing good and bad weavers to a common level. The direct effect of the proposed restrictions would be to lessen the ability to pay liberal wages, and in the end mills might be compelled to surrender in the contest with Southern rivals.

In Seattle and in Fairhaven, the new city 122 miles north on Puget Sound, real estate is spoken of as the principal industry, the boomers being fully occupied in finding customers. The general advice is to hasten and get in on the ground floor, but in the opinion of some of a less sanguine disposition the ground floor is now well occupied. Others believe that some time will elapse before the top notch in prices is reached. The effect of the agitation is to attract more adventurers than capitalists, so that many instances of hardship occur among those in search of an occupation. The general belief, however, is that a great city will grow up somewhere on Puget Sound.

The Pennsylvania Railroad Company are considering the expediency of sheathing the new iron ferry boat building at Elizabethport, N. J., to avoid the accumulation of marine growth and to secure a greater average speed, without the necessity of frequent docking.

The London *News* says that several of the mail steamers on the Liverpool route would fill the requirements of the American subsidy law as to size and speed, but fails to take note that the Americans must have boats of American construction, to be admitted under the flag.

The new plant of the Elizabethport Iron Works of the S. L. Moore & Sons Company, where the new practice cruiser is building, is not only extensive and efficient, but embodies many of the latest improvements in machinery and tools, where power, facility and economy are carefully studied. Hydraulic power is extensively used. Among the objects of interest was an electrical traveling crane able to lift and transport 27 tons with ease, under the direction of one man.

As a result of a meeting of the six commissioners of the Western Traffic Association, Chairman Walker says the practice of making regular Chicago rates from the depots of Eastern railroads to points in the far West must be discontinued. "It was evident," he says, "that the gross revenue of the members of the association would be affected seriously by the allowances made to Eastern railroads for their services in case through rates to Western points should be made from their depots, and that the establishment and maintenance of agreed through rates would be complicated and rendered more difficult by bringing in as parties to through lines to Western points many of the Eastern railroad lines terminating in Chicago."

A. F. Walker, chairman of the Western Traffic Association, delivered an address before the Sunset Club, in Chicago, last week, on the subject of the pooling of railway earnings, which he claims should be legalized. He said: "The pooling of railway earnings is a temporizing expedi-

ent, but it is the best known resource for the preservation of the American railway system. The re-establishment of the pooling system would impart a new tone of confidence in railway circles. The benefits would extend to the price of all commodities bought or sold in the public markets, and even to the wages of labor in the factory and the mine.

The new law to regulate immigration went into effect April 1, and under the system of inspection provided a score or more of the diseased, pauper or criminal classes have been rejected, to be returned by the steamship lines which brought them. The new restrictions were imposed none too soon, as the influx of immigrants during the year promises to exceed 500,000, surpassing all precedent. During the three months just ended 12,319 Italians were landed at the Barge Office in this city. With the exception of the immigrants from the Austrian Empire, who numbered 13,689, this is the largest number of immigrants of any nationality ever landed in the same time. The total immigration was 82,219. Of these 11,886 came as cabin and 70,333 as steerage passengers. Germans and Alsatians numbered 11,672; Russians, Poles and Fins, 11,664; English, Irish, Scotch and Welsh, 7572; Swedes, Norwegians and Danes, 6670; other nationalities made up the balance. The English, Irish, German and French immigrants were all of the better class and an improvement over those who have come here in past years.

The late George Peabody's gift of \$2,500,000 to provide dwellings and lodgings for the poor of London has now grown, by the addition of rents and interest, to a total of \$5,117,230, while the land and buildings under the care of the trust are valued at \$6,169,225 more. Up to the end of last year there had been 5071 dwellings furnished to the artisan and laboring poor of London. The dwellings are not in a group, but are scattered over the city, having been placed where they were likely to do the most good. Vital statistics show that this plan has contributed to the health as well as to the comfort of the poor, and at the same time has enabled them to retain their self-respect and independence.

The automatic car coupler must be considered as now practically adopted. The *Engineering News* shows that companies with 72,000 miles of track and 700,000 cars, or nearly half the track and sevenths of the cars of the United States, are putting the coupler on all new cars. Practically half the railroads by mileage, and over two-thirds measured by cars, are committed to this great reform.

The Chinese population of California has decreased since 1880 and now numbers 71,681.

The foundrymen of this city, Brooklyn and Jersey City, members of K. of L. locals and open trade unions, will join in a demand for nine hours on May 1. They are now working ten hours.

Work has actively commenced on the 4-foot steel pipe line with which the East Jersey Water Company intend to furnish 50,000,000 gallons of water daily to the city of Newark from the headwaters of the Pequannock River. Clement Herschel of Holyoke is the chief engineer, and he has an efficient corps of assistants in the branch office at Paterson and in the field. Newark is to pay \$6,000,000 for the works when completed, and the contract calls for the delivery of the water on May 1, 1892. The material of which the pipe is made is rolled sheet steel, and it varies in thickness according to the place in which the pipe will be laid. On the tops of the hills it will be $\frac{1}{2}$ inch thick, while in the deep valleys it will be $\frac{1}{4}$ and even $\frac{1}{8}$ inch

in thickness. A big plant has been erected near Paterson, on the Susquehanna Railroad, by McKee & Millson of Pennsylvania, and it is now running day and night, bending and riveting the plates into pipes 4 feet in diameter and 28 feet long. These lengths, after being finished, are dipped in a huge trough of hot asphaltum and then drained. When the pipe is in place in the ditch, it is riveted together with red-hot rivets, and the joints and all abrasions are carefully coated with asphaltum. Then the whole is covered with earth, and it is asserted by the engineers in charge that it will last for ages. There are critics, however, who say that it will all have to be renewed in 30 years at the most, and that it is a piece of costly folly to put in steel pipes.

The Commissioners of the District of Columbia at Washington last week opened bids for street lanterns. The following were received: H. J. Gregory, \$3.85; Jacob Minn, \$4; the Wheeler Reflector Company, \$3.73; New York and New Jersey Globe Gas Company, \$3.85. Bids were also opened to furnish cast-iron water pipes, and the following submitted proposals: The Steel Car Mfg. Company, C. S. Casson & Co., Chapman Mfg. Company, Shepherd & Hurley, Thomas Summerville & Sons, Amden Iron Works, David B. Chew, McNeal Pipe Company and Fred Stone & Co.

The French first-class battle ship Marceau, building since 1881, has just completed her contract trials at Toulon. The Marceau has a tonnage of 10,600 and carries a principal armament of four 34-centimeter (13.4 inch) guns in barbette turrets, and 17 14-centimeter (5.4-inch) guns. Her subsidiary armament includes 12 quick-firing guns, eight mitrailleuses and four torpedo-launching tubes. Her speed on trial came up to 16.4 knots. The 34-centimeter guns are so arranged as to allow three of them to be brought to bear simultaneously in any direction.

Mails can no longer go northward from Chili by the usual route—up the Pacific to Panama; thence across the Isthmus and to New York via the Atlantic, but on account of the blockade they must be sent overland to Buenos Ayres, from Los Andes over the mountains and across the Argentine Republic, requiring at least ten days or more time in transit from Santiago or Valparaiso to New York.

A letter written from the Amazon Valley, in Brazil, speaks of the trading opportunities of that region, which Americans should not be slow to improve. The writer says: "The importance of the trade of the Amazon Valley is scarcely understood in our country. But few people seem to realize that the rich territory known as the Amazonas covers an area equal in extent to all that part of the United States east of the Rocky Mountains. Practically nothing is produced in this country, by reason of the fact that the gathering of the rubber is so much more remunerative than any other employment that it absorbs almost the entire labor of the country. It is, therefore, apparent that it must be a fine field for development in the way of imports from our country." The trade of the valley is nearly all concentrated at Para.

The *Army and Navy Gazette* of London says: "In the Royal Sovereign we have a fighting machine which is emphatically the expression of the combined thoughts of the most experienced naval architects and naval officers upon what should comprise the best features of a battleship. She will be triumph of engineering art, but she is more than this, for her design fills not only the ideas of the architect but also the matured aspirations of the seaman as to the vessels in which he is to fight his country's battles."

The Iron Age

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CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

A Convention with Canada.

Pursuant to statements emanating from the Canadian Premier pending the recent election, Sir John Macdonald authorizes a semi-official announcement of the policy intended to be pursued with reference to improved commercial relations with the United States. In accordance with the general scheme Sir Charles Tupper, the Canadian High Commissioner, who is supposed to act under instructions from the Imperial Government and at the same time to be fully in accord with the powers at Ottawa, has ventured to interchange ideas with the Secretary of State at Washington, and so far as practicable agree upon a plan that shall subsequently be ratified by the United States Congress. Beyond preliminaries, it is explained, little progress can be made at present. In any case Congress, which does not meet until December, could not take action sooner than a year hence. Besides that cause of delay there are certain complications growing out of difficulties in Newfoundland in its relations to the Dominion which are liable to prejudice negotiations that might be attempted meanwhile. Secretary Blaine, it is intimated, "prefers to conclude a treaty applicable to both Canada and Newfoundland, rather than to draw up separate conventions, since less difficulty will be experienced in persuading the island Government to join the Dominion in overtures to Washington."

The Ministerial organ in Montreal outlines the probable scope of the desired treaty, including among its provisions a renewal of the treaty of 1854, new fishery regulations and a relaxation of the coasting laws of the two countries as respects seaboard and inland trade. At this point it becomes interesting to inquire whether any new stipulations under these several heads will satisfy the clamor of the great Liberal party in the Dominion, who so nearly wrested the scepter from the powers at Ottawa. Premier Macdonald's organ interposes a series of negatives of an ominous character. "The result of the recent elections," we are told, "has made the Dominion Government not less anxious to conclude a commercial convention with the neighboring Republic, but it has, also, confirmed the limitations by which the negotiations must be surrounded. Discrimination against British goods will not be permitted; the control of the tariff will not be surrendered, and serious loss of customs revenue will not be risked."

This oracular utterance is chiefly significant for its omissions. No allusion is made to "reciprocal trade," so loudly de-

manded in certain quarters; no cheap American manufactures can be permitted north of the St. Lawrence River, however much Canadian products might be desired in exchange, and the Canadian customs revenue must be maintained. The restricted reciprocity thus defined would certainly be rejected by the Canadian Liberals, however regarded by the diplomatic representatives of the high contracting parties—that is to say, the people.

Construction of Boilers for Forced Draught.

Considerable trouble has been experienced in England by reason of leaks developed in boilers subjected to forced draught. It is therefore gratifying to find an able discussion of the question in a recent paper read by A. F. Yarrow before the Institution of Naval Architects. The author boldly criticizes many features in the design and construction of the present boiler and offers suggestions which, in the light of his experience, would obviate much of the trouble.

Concerning the quality and condition of tubes, the statement is made that the best procurable are none too good. They should be of the most ductile material, carefully annealed at the ends, and should stand flattening and bending without cracking. The elasticity will permit all of the tubes to share the strain brought on the plate. The method sometimes followed of expanding a tube by means of a taper pin into a parallel hole is condemned, since it is not possible by this means to make the tube fit perfectly in the entire length of the hole. The expander should be passed well through the plate, so as to form a shoulder in the tube, which will bear against the inner side of the plate and thereby prevent the tube from shifting in the hole when subjected to a comprehensive strain. Probably the best way of securing the tube is by means of an expander, which will form a bead on the tube each side of the plate, since this perfectly resists both tensile and compressive strains and prevents all movement of the tube. The custom now so widely followed of beginning at one side of the plate and expanding all the tubes is condemned, for the reason that it brings strains upon one portion which are not counterbalanced. It is therefore deemed desirable to expand a few tubes in one part of the plate, then to shift to another part, and in this way cover the entire surface, and as near as may be, subject the plate during the process of expanding to like strains all over.

When a tube is expanded in a tube plate it is increased in diameter and pressed against the sides of the hole in the plate, this pressure serving to slightly increase the diameter of that hole. The two metals are in reality pressing against one another. As long as the joint thus formed is not subjected to a reduction of temperature it keeps tight, but when steaming hard, if the fire-door be opened and a blast of cold air admitted, the tubes through which it passes, being thin, feel the effect quickly

and contract before the thick tube plate. The tubes remain tight only as long as the chilling effect is less than the collective elasticity of both tube and plate. If the tube plate be thin the trouble from this cause will be reduced. A partial solution is arrived at by making the tubes a driving fit into the plate and not by simply slipping them in and then depending upon the expander to bring them to the desired fit. Mr. Yarrow holds that the employment of tube plates $\frac{1}{2}$ inch thick and even $\frac{3}{4}$ inch thick would obviate much of the difficulty now found.

For many years Mr. Yarrow has not used stay tubes in his own works, because they are invariably made thicker than the others, and the practice of having rigid tubes alongside those which are elastic is undesirable. If stay tubes must be employed, they should be of the same degree of elasticity as the others.

Some years since experiments were made by him to ascertain the power required to withdraw tubes expanded in plates in the usual way. It was found that a 2 inch tube had a holding power in a steel plate of from 8 to 12 tons and the total holding power was 2300 tons against, at a steam pressure of 200 pounds, a strain tending to separate the two tube plates of 124 tons, thus giving a margin of safety of nearly 20, amply sufficient for all conditions.

If tubes leak without ferrules there is no reason, based on experience, to believe that ferrules will cure it, since they do not strike at the root of the evil. They may be used to advantage for those tubes which are subjected to the fiercest flames, by interposing a resistance to the rush of flame by reducing the area and thus causing the heated products of combustion to pass more uniformly through all the tubes.

The distance between the tubes should be such as to insure an ample supply of water to the hot surfaces and avoid imprisonment of steam between the tubes. Nothing less than $\frac{1}{2}$ inch, or, better still, 1 inch spaces, should be adopted with 3 inch tubes when burning 80 to 100 pounds of coal to a square foot of grate. This insures good circulation, provided the latter is not interfered with by any other features in the design.

Experiments were made in order to ascertain the changes in tubes at different levels when raising steam. It was found that almost immediately after lighting up the top row of tubes was heated in advance of the others, this being due to the presence of heated water near the surface, the cold water at the bottom remaining undisturbed. Those tubes near the surface were increased in length by expansion, and as this tendency was resisted by the tube plates there was considerable bending of the tubes. After the fire had been alight a few moments the second or next lower set of tubes began to move in like manner as the lower level of water rose in temperature, and so on down through the different layers. As soon as 10 or 15 pounds were registered the pressure on the tube plates began to be felt, and they were then forced apart, throwing a tension on the tubes sufficient to straighten them.

These experiments proved how essential it was to insure ample elasticity in the tubes, so as to conform to conditions arising when getting up steam. In order to prevent undue strains coming on different parts of the boiler during the raising of steam it is recommended that the boiler be quite filled, and as the temperature rises allow the water to run out from the blow-off cock, so that by the time steam shows itself the water will be at the proper working level. In this way the upper part of the boiler is warmed up and the cold water at the bottom is got rid of.

One of the most interesting causes of leaky tubes, and one which it is said has been almost entirely overlooked by the marine engineer, is the tendency of two plates to curve. The surface of the plate next the fire tends to expand, while the opposite surface tends to remain as it is, being kept cool by the water. The result is that the two portions being unable to separate, are obliged to enter into a compromise, and the hot surface expands to the full extent due to the difference in temperature, except in so far as it may be prevented through its connection with the cooler surface, which it permanently strains. Now the question is asked, what happens when the boiler cools down? The surface next the fire wants to contract, but the other being in contact with the water and not changing its temperature does not want to contract. The two surfaces, therefore, enter into a fresh compromise, the result of all these compromises being, if the plate is thick and the variations in temperature are great, that a permanent distortion of the plate takes place through this differential contraction and expansion. The holes are drawn out oval, some in one direction and some in another. When it is remembered that every time the fire door is opened and closed the plate wants to change its form and cannot do so, and when we bear in mind that the fire-door in a large forced-draft boiler is opened, say, once every minute, which in 24 hours corresponds to 1440 times, it is easy to see that the varying expansions and contractions set up disastrous molecular strains and that the tube plate is undergoing very harsh treatment. Mr. Yarrow described an experiment which confirmed this. A plate which was kept flat was heated and cooled on the lower side, the water being on the upper, thus approaching the condition of the plate in an ordinary boiler. After this was repeated several times an accurately bored hole $3\frac{1}{2}$ inches in diameter showed a most decided distortion. In order that the plate may successfully withstand this repeated tendency to distortion without harm it should be made as thin and flexible as possible. Mr. Yarrow declares that he knows of no practical reason why the tube plate should not be made as thin as $\frac{1}{8}$ inch. A good joint could be made and the plate would be of ample strength, stayed as it would be by all the tubes.

In laying out tube plates it is thought best to place the holes in vertical and horizontal lines rather than zigzag, since

by the former 1 inch spaces can be got, while the latter will only give $\frac{3}{4}$ -inch spaces, the number of holes remaining about the same.

Tests made to show the relative tendency of copper and steel plates to curve, when heated on one side only, showed that this tendency was greatly reduced in the copper plate. This was ascribed to the better conducting power of copper, which never gets heated to anything approaching the same degree of steel, because the heat is carried away from the surface exposed to the fire more rapidly. "For this reason we decidedly prefer copper and have used it in all the torpedo boats we have built for foreign powers and in a few constructed for the British government, and we have had no reason to regret the selection of that material. Summing up the comparative merits of copper and steel for fire-boxes, every locomotive superintendent in this country, without exception, has far more confidence in copper. I have taken great pains to ascertain the results of the actual working of the steel boxes adopted in the United States, and I am fully convinced that they have more trouble from leaky tubes on the other side of the Atlantic with their steel boxes than we have on this side with ours of copper. Our own experience in torpedo boats is unquestionably in favor of copper." Experience has shown that if any galvanic action takes between the two metals it is not sufficient to counterbalance the advantages of copper.

Regarding air pressure, the paper shows that in the passage of the air from the stokehole to the funnel the greater part of the resistance to be overcome is due to forcing the air through the tubes, and if the contractor is limited to a given amount of air pressure he must meet this condition by increasing the diameter of the tubes or reducing their length, either of which is objectionable, since it affects the elasticity. The designer should be free to adopt whatever air pressure he likes, so long as he is satisfied that the boiler will successfully stand it. It is better to adopt a high air pressure and have a reliable boiler than to limit the pressure and have a boiler which may at any moment give way. In other words, a low air pressure involves a rigid boiler, which is not reliable.

Our attention has been called to an inaccuracy which crept into the article on the manufacture of seamless tubing published in the last issue of *The Iron Age*. Objection has been made to the following paragraph: "Since 1886 there have been at least two other attempts to start a seamless tube business in this country, one in Philadelphia and one in Waterbury, both of which have as yet been unsuccessful." The Waterbury attempt, we are informed, was that of Holmes, Booth & Haydens, who purchased the old Bridgewater plant from E. L. Hall of Philadelphia, who never set it up and who added some new machinery. We are informed that this concern has been making large quantities of tubes since last November. Another

concern which has started since 1886 is the Coe Brass Mfg. Company of Torrington, Conn. Since January last this mill, acknowledged to be the model brass works of the Naugatuck Valley, has been throwing out tubes in considerable quantities, increasing rapidly.

Speculation in Brazil.

An era of speculation prevails in Brazil which in some aspects appears from this distance to be nearly a repetition of the recent financial career of the Argentine Republic. Prior to 1889 there were half a dozen great banks in Rio de Janeiro. At the head of these stood the Bank of Brazil, an old institution with a capital of \$15,000,000 and a note issue of like amount. It was the only bank in the Empire having a note issue. The Government put out treasury notes corresponding to our greenbacks, and the issue at the beginning of 1889 was about \$100,000,000. There was nominally a gold and silver coinage, and a subsidiary coinage of nickel and copper, but, as a matter of fact, the treasury notes had been at a discount for many years and the gold and silver had been hoarded. Beginning in 1888 the paper money gradually appreciated in value, and in September, 1889, it reached par, 27 pence to the mil-ras. This was brought about by an unprecedented crop of coffee, which commanded high prices, and an increase in the price of sugar and rubber.

The revolution postponed to a later period the fine prospects about to open, but the boom had been started, and in February, 1890, an opportunity was improved by the new administration to establish by decree the Bank of the United States of Brazil, with a capital of \$100,000,000, and the right to issue a like amount upon 4 per cent. bonds to be deposited in the National Treasury. Other banks were authorized, to whom were granted special privileges favorable to almost every kind of speculative undertaking. It is estimated that within a year not less than 100 have been established, including savings banks, building association banks, banks for the poor and banks for workingmen, with a large nominal capital.

A letter from Rio de Janeiro says that the aggregate nominal capital of the companies which have been created since September, 1889, amounts to several billions of dollars. As the law stood prior to October 13, 1890, a company was supposed to pay up 10 per cent. on their nominal capital before they could organize, and 10 per cent. more before their shares could be transferred. A decree of October 13, 1890, was designed to stop the creation of new companies and to discourage speculation, and for this purpose it was required that deposits of money paid in should be with banks of issue over which the Government had supervision. This attempt seems to have proved futile. Means were found to evade the law, and a few days ago a decree was issued to regulate the formation of stock companies. Whether it will prove more efficacious is

doubtful, as new corporations, each fully equipped with high salaried officials, continue to multiply. Some are already able to place to their credit handsome amounts of legitimate net earnings, while others are of such a visionary character that their end may plainly be foreseen. The occasional brilliant successes only tend to aggravate the situation already regarded as critical by conservative minds.

The Commonwealth of Australia.

Another republic has been born, to be enrolled in the family of nations. It comprises the Australian colonies of Great Britain, which have confederated themselves for common defense, adopted a constitution and chosen the name "Commonwealth of Australia." Thus is realized, in part at least, the fondly cherished dream for which some of the more zealous among the subjects of the Queen in those parts have earnestly labored. But the new Government, though ostensibly a republic, is a sort of hybrid in which some of the features of a monarchy have a subordinate place. In the main, the new commonwealth is modeled after the United States, all its powers being delegated by and derived from the several colonies, who, through their representatives lately assembled at Sydney, the capital of New South Wales, formally united in a compact which may long and honorably endure. The one peculiar characteristic is the tacit declaration of loyalty to the Imperial Government implied in the provision that a Governor-General shall be appointed by the Queen, as is done in the rule of the Canadian Dominion, although the Governors of the several colonies shall be appointed by the parliaments respectively, instead of by the British crown, as heretofore. This feature, it might be assumed at this distance from the theater of events, is intended to disarm any latent suspicion of disloyalty. Seven ministers constitute the Council, exercising functions similar to those of the Cabinet in our own form of Government, and there is an upper and lower House, each of whose members shall receive \$2500 per annum. The Queen may overrule the decisions of the Supreme Court, as she in like manner may veto the acts of Parliament. New Zealand alone holds aloof from a full acceptance of the scheme, to await future developments. The new commonwealth already possesses the rudiments of a navy, and works for the common defense will naturally follow in due course. It is in the mutual adjustment of tariff differences, however, that the United States will feel a special interest—it being a task of no ordinary magnitude to produce homogeneity where policies so widely at variance already exist in the separate communities. But this consummation may be long delayed. The most immediate advantage ought for in the new federation is probably the consciousness of comparative safety from the aggressiveness of ambitious powers seeking territorial extension. Back of all, however, it is not unreasonable to suppose that there lurks a sentiment not unfavora-

ble to ultimate political independence. With strong American sympathies pervading the masses of her citizenship, derived in part from early settlers from California, relations with her elder sister in the antipodes will ripen into closer intimacy, with mutual advantage.

OBITUARY.

J. H. BUCKINGHAM, treasurer and general manager of the Chicago Steel Works, dropped dead of heart disease while conversing with friends in his room at the Hudson House, Lansing, Mich., on Sunday morning.

GEORGE W. CHEESMAN, one of the most prominent manufacturers in Connecticut, died at his home in Birmingham, Conn., on Tuesday night of typhoid pneumonia. He was treasurer of the Osborne & Cheesman Company, with factories in Ansonia and Shelton, and was a director in several other manufacturing concerns.

JOSEPH CLARK, senior member of G. W. Hildreth & Co., Lockport, N. Y., died March 26, of hemorrhage of the lungs. Mr. Clark had been confined to the house for a number of weeks with malaria fever, which finally resulted in hemorrhage of the lungs. Those who knew him best speak in high terms of his character and business qualifications.

JOHN HARPER, one of the foremost business men of Pittsburgh, and for 25 years president of the Bank of Pittsburgh, died at his residence in that city, on Sunday, April 5. Mr. Harper was 80 years of age, and was connected with many of the prominent business institutions of Pittsburgh.

CAPT. THOMAS H. LAPSLEY died at his residence, at Braddock, Pa., on Sunday, April 5, from paralysis of the brain. Captain Lapsley was 72 years of age, having been born at Pine Creek, Allegheny County, Pa., in 1819. He was identified with the Edgar Thomson Steel Works of Carnegie Brothers & Co., Limited, at Braddock, Pa., from its organization, and was still connected with it at the time of his death.

PERSONAL.

Andrew Carnegie arrived in Pittsburgh on Monday evening, the 6th inst., and will be there all of the present week, looking after the various enterprises in that city with which he is connected.

B. G. Clarke of the Lackawanna Coal and Iron Company and the Thomas Iron Company is on a trip in the South.

Alfred H. Raynal, late general superintendent of the Richmond Locomotive and Machine Works of Richmond, Va., has accepted the position of general superintendent of the ship yard and iron works of Samuel L. Moore & Sons Company of Elizabeth, N. J.

Two cargoes of bituminous coal for Europe and another from Baltimore have been cleared within the past fortnight. The explanation is that labor troubles in England and Germany just now increase the cost of mining. Even with this advantage American coal could not be exported at a profit, if other cargo could be obtained for ballast.

Newfoundland refuses bait to all Canadians, but American fishing vessels are welcome. The Newfoundlanders are good at fishing, themselves.

About 1000 sheet-iron cornice makers are on strike for higher wages in the Twin Cities.

Rioting in the Coke Region.

The attempt of the Connellsville coke operators to put their plants in operation has, as expected, met with violent opposition from the strikers and has also resulted in bloodshed. On the morning of April 2 a mob of rioters made an attack on the Morewood works of the H. C. Frick Coke Company and destroyed much valuable property. As the band of strikers numbering about 500 men, many of whom were under the influence of liquor, charged on the works, they were called upon to halt at the peril of their lives. The mob answered with curses and yells and kept on their course. The order to fire was then given and seven strikers were instantly killed and about 30 wounded. Several days before this rioting occurred the different plants had been put in charge of deputy sheriffs for the purpose of protecting them from the violence of the strikers. No violent demonstrations have been made since, although the excitement is at fever heat and more trouble may occur at any time. As soon as possible after the conflict had taken place, word was telegraphed to the Governor of Pennsylvania and troops were ordered to the scene of action. The Connellsville coke region is now under military protection. It is the intention of the coke operators to carry out their original plans of putting their plants in operation and to give employment to their men as fast as they can. They also have determined to give them military protection, and it is believed that the presence of the troops in the region will have the effect of demoralizing the strikers and that the men will be enabled to continue at work. The causes which led to the trouble and shooting are fully set forth in an authorized statement furnished by H. C. Frick, chairman of the H. C. Frick Coke Company. This statement is an answer to charges made by Robert Watchorn, formerly secretary of the Miners' Union, that the riot grew out of the attempt on the part of the H. C. Frick Coke Company to compel Hungarians to resume work. The statement by Mr. Frick reads as follows:

My attention has been called to an interview, wherein ex-Secretary Watchorn of the Miners' Union is reported to have charged that the present violence in the coke region grows out of the attempt on the part of our company to compel Hungarians to go to work. Mr. Watchorn is an appointee of Governor Pattison, and from his official position his utterances might be regarded as coming from the Executive Department of our State, and therefore I think it worthy of reply. In this interview Mr. Watchorn also charges me with having imported thousands of foreigners, promising them a sort of Utopia, and attempts to hold me, therefore, responsible for their acts. Mr. Watchorn well knows that this same charge was made by the labor leaders in a former strike, and at my request a full investigation was made of it by the appointed representatives of our National Government. He also well knows that in that investigation our company gave to the Government full access to all of their records and correspondence, and that a report was thereupon made and filed in Washington city completely exonerating both myself and our company from these charges. With these facts, so well and personally known to Mr. Watchorn, I cannot imagine any justification that he has for repeating them, as they were untrue when originally made, both as concerns myself and our company, and he knows them to be untrue now. I am now ready and willing to state that neither myself nor our company, nor any one on their

behalf, directly or indirectly, assisted, procured or requested any man to emigrate to this country, and if Mr. Watchorn or any of his associates challenge this statement in any particular we are prepared for the fullest examination.

Although the violence committed in the vicinity of our works has been mainly by foreigners, the public knows that these people are simply the tools working out the plans and designs of others. The plan now adopted of using these men to accomplish their work of violence is but a repetition of former acts. In every strike in the coke region these are the men who have been used, and found to be pliant tools, whenever violence is to be done. The public should not allow itself to be blinded to the real authors of the present trouble. The controversy is now not one between our company and their employees, but between the lawful authority of our Commonwealth and a mob of irresponsible men in the hands of cunning demagogues. This breach of the peace and violation of the law of our land is not the result of a sudden gush of uncontrollable passion, but is the result of a deep-laid scheme and well-planned attempt to overrule the civil authority of our State. Not the foreigners, who are advised that their living depends upon their resort to violence, are to be blamed for this, but those who give that advice. Riot and bloodshed are the inevitable and natural results of the influence and counsel of bad advisers. They have called meetings of these foreigners and have incited them by incendiary speech, well knowing that when excited they will resort to violence, and then try to exonerate themselves by saying that this foreign element has gotten beyond their control. It needs no argument to show that this violence is the results of such acts, and the public press and the lawful authority of our State should fix on them the responsibility rather than upon the poor deluded foreigners. The sentiment of the people and the established civil authority of our State should see to it that these men do not escape the odium resting upon them, which is due to their acts and conduct.

Finding we were not able to pursue our business peacefully, we handed over our works to the civil authorities of the State. Let the labor leaders, if they can, show how it came that these men, belonging to their union, and whom they claim to represent, came in conflict with the authority of the State. Let them explain why these rioters were marching around our works with drums and firearms at 3 o'clock in the morning. Why did the sheriff deem it necessary at all to have deputies to preserve the public peace if these men were law-abiding men, as the leaders would have you believe they are? It is a significant fact that not a single employee of the Morewood Coke Works, where the riot took place, is found among either the killed or wounded. Mr. Watchorn charges that we were trying to compel these men to go to work, and with such falsehoods as these trying to throw the blame off themselves on to our company and the officers of the law. This is too serious a matter for the public to ignore, and the press owes it to the people and to the Governor of the State, who is called upon to act in this matter, to expose this sham and present it in its true light. The statement made by Mr. Watchorn that we were trying to compel our men to go to work is false. We simply offered to put our works in operation again, and to employ such men as wished to go to work upon a sliding scale proposed by our company, based upon the selling price of coke. Many of our men accepted this proposal, and were glad to do so, and it is to prevent these men, willing and anxious to work, from doing so that violence has been resorted to.

Coal Product of the Far West.

The Census Office has just issued an interesting bulletin on the coal product of the region west of the Mississippi River, prepared by John H. Jones.

The following is a comprehensive synopsis of this valuable paper:

North and South Dakota.—The ascertained coal areas of the States of North and South Dakota lie in the western counties, between a line drawn from the Turtle mountains in the north, through Burleigh County, to the southern borders of the Black Hills and the western boundary line. The principal developments have been made along the line of the Northern Pacific Railway at Bismarck and westward at points along the Missouri River as far north as Fort Stevenson and also in the vicinity of Hay Creek, in the Black Hills. The product is a fair grade of lignite or brown coal, suitable for heating and steam, and in some localities is found to be adapted for the manufacture of gas. The seams vary in thickness from a few inches to 12 feet. The absence of transportation facilities has hitherto retarded the development of the coal-mining industry, but under the new conditions of Statehood increasing demands will encourage railroad construction and stimulate a more intelligent prosecution of mining operations. The output of all mines in North and South Dakota during the calendar year 1889 was 28,907 short tons, of which 7292 tons were from the ranchmen's diggings and local mines. The total product was valued at \$41,431.

Kansas.—The coal measures of Kansas cover an area of about 10,000 square miles, underlying the entire eastern portion of the State. The coals are bituminous in character, similar to the coals of other States in the great Western or Fourth field, and are found to be excellent for cooking, steam, gas, smelting and domestic purposes. Lignite deposits have also been worked to some extent for local trade along the western limits of the coal areas in Cloud, Republic, Ellsworth, Russell and Jewel counties. Although coal deposits are known to exist in about 20 counties in the State, regular mining operations are conducted in but six—viz., Leavenworth, Franklin, Neosho, Cherokee, Bourbon and Osage—while in the remaining counties operations are confined to country banks, supplying local trade. The veins vary from 1 to 5 feet in thickness, and are mined by shaft as well as by "stripping." The output for the calendar year 1889 was 2,230,763 short tons, valued at \$3,294,754, or an average of \$1.48 per ton at the mines. The average number of persons employed in 1889 was 5063, and the amount of wages paid \$2,320,591.

The State conducts coal-mining operations upon an extensive scale at Lansing, in Leavenworth County. The convicts in the penitentiary are employed at these mines, and the product, after supplying the State House and public institutions, is sold in the open market.

Indian Territory.—The Western or Fourth field, which comprises the only deposits of the carboniferous measures west of the Mississippi River, extends across the boundaries of Kansas, Missouri and Arkansas into the Indian Territory, underlying almost the entire eastern half of that Territory. The present developments of importance are in the Choctaw Nation reservation.

The quality of the coal now being mined in this Territory is excellent for steam and heating purposes, and is well suited for gas and coking. The beds from which the product is obtained range from 3 to 5 feet in thickness, and comprise the two lower veins, which are here found to be of much greater thickness and freer from

bone and other impurities than in any other part of the field. Competent authorities assert that the coals now being mined in the Indian Territory are superior to any found west of the Appalachian field.

The total product in the Territory during the calendar year 1889 was 752,832 short tons, valued at \$1,323,806. The average number of persons employed during the year was 1867; the total wages paid, \$927,267.

Iowa.—Almost one-half of the State of Iowa is underlaid with coal. The northern extremity of the great Fourth field occupies the southern portion of the State, extending across the southeastern counties of Nebraska, thence southward through Kansas, Missouri, Arkansas, Texas and Indian Territory. Coal is produced in 26 counties, and is of a quality generally well adapted for steam and heating purposes. No cannel or gas coal is found in the State. The total product of all grades during the calendar year 1889 was 4,061,704 short tons, valued at \$5,392,220. The average number of persons employed during the year was 9198, and the amount of wages paid \$3,903,291.

Missouri.—Coal is found in 39 counties in Missouri, the deposit being a part of what is known as the Fourth field, underlying portions of Iowa, Nebraska, Kansas, Missouri, Arkansas and the Indian Territory. The geological surveys of the State have not as yet clearly defined the outcroppings of the beds in the several counties, but mining operations have been conducted to a greater or less extent in the territory lying north of the Missouri River from the western boundary to the Mississippi River, and in the counties lying south of the Missouri River, between Kansas City and Jefferson City, and along the western boundary to Jasper and Dade counties. The principal developments are within Adair, Audrain, Barton, Bates, Caldwell, Callaway, Grundy, Henry, Johnson, Lafayette, Macon, Montgomery, Putnam, Randolph, Ray and Vernon counties. The character of the coal is semi-bituminous, and is adapted for steam and heating purposes as well as for smelting. Deposits of cannel coal are found in Moniteau and Cooper counties. The total product of all grades during the calendar year 1889 was 2,567,823 short tons, valued at \$3,478,058 at the mines. The number of persons employed was 6739 and \$2,546,812 was paid in wages.

Arkansas.—The coal deposits of Arkansas are located in the western part of the State, upon either side of the Arkansas River, extending, with more or less persistency, between Fort Smith and Little Rock. Mining operations have been conducted in Sebastian, Logan, Franklin, Crawford, Johnson and Pope counties. The local districts are known by the following names.

The Western or Sebastian County district; the Coal Hill district; the Philpott district; the Ouita district.

The coals of Arkansas are variable in quality, and are adapted for steaming, coking and gas manufacture and domestic purposes. Coal mining in this State may be said to have begun about the year 1870, but it did not assume commercial importance until about the year 1883. The quantity of coal mined in the State during the calendar year 1889 was 279,584 short tons, valued at \$395,836; the number of persons employed, 588, and the total wages paid, \$205,009.

(To be continued.)

Boston papers show that 57 corporations in Fall River, with an aggregate of \$18,000,000 capital, have earned during the year less than 2 per cent., and in many instances nothing at all, and argue that labor has received its full share of compensation.

The main engines developed 3350 horse-power. Allowance for the auxiliaries 100 horse-power; total 3450 horse-power. Required by the Department 3400. The gunboat will be sent to the Brooklyn Yard.

TREASURY DECISIONS.

The Treasury Department is gradually getting the operations of the tariff under the act of 1890 in shape. The following decisions have just been promulgated: Under a protest against duties assessed on steel scissors, the United States General Appraisers decide that the articles under consideration are scissors made from steel. Duty was assessed upon them at 45 per cent. ad valorem. The importers claim that as scissors are not provided for by name those in question should have been returned for duty at 35 per cent. ad valorem, under section 5 of the new Tariff act, as assimilating to swords, &c. This contention is not tenable. The similitude clause of section 5 is applicable only to non-enumerated articles. It is true, as alleged, that scissors are not provided for by name in the present act, but they fall within the provision "composed wholly or in part of iron, steel," &c.

In a construction for assessing duties on copper in pyrites ore, the appraisers decide:

Duty was assessed at $\frac{1}{2}$ cent a pound on copper contained in certain pyrites ore. The importer claims free admission for the ore and the copper contained. The act of 1890 covering the subject is as follows:

Pyrites or sulphuret of iron in its natural state containing not more than $3\frac{1}{2}$ per cent. copper 75 cents a ton: Provided, That ore containing more than 2 per cent. copper shall pay in addition one half of one cent per pound for the copper contained therein: Provided also, That sulphur ore, as pyrites or sulphuret of iron in its natural state, containing in excess of 25 per cent. of sulphur, shall be free of duty, except on the copper contained therein, as above provided.

The only provision in this paragraph applicable especially to copper is when it constitutes more than 2 per cent. of the ore. Consequently in sulphur ore containing more than 25 per cent. of sulphur and less than 2 per cent. of copper the copper as well as the ore is free. As an assay of the ore in question returns sulphur 37.65, copper 1.73, the claim of the importer is sustained.

An invoice of zinc plates invoiced at £14. 15/6 has been advanced by the U. S. General Appraisers to £30. Also cold rolled shank steel 4 x 21G entered at £13 per ton. No advance.

The big new gun factory at the Watervliet Arsenal will in about three weeks be fully supplied with incandescent electric lights, the Edison Company of New York, to whom the contract was awarded, having placed a force at work. Throughout the north wing of the factory and in the main structure about 250 lights will be placed. In each end and at the center will be one lamp of 2000-candle power, and 218 lamps of 16-candle power will light the remainder of the building. Power will be furnished by a large dynamo, to be placed in the small room immediately south of the engine room and connected with the large engine that drives the machinery of the shop. The rifling of the new 12 inch gun, which is the largest piece ever made at the arsenal, has been commenced in the small factory. There are also in construction several pieces known as $3\frac{1}{2}$ inch guns. Twenty-five 8-inch pieces are in course of construction in the large gun factory. Superintendent Christiansen says that the 12-inch piece will be completed in a few weeks and sent to Sandy Hook to be tested.

MANUFACTURING

IRON AND STEEL.

Julian Kennedy, chief engineer of the Buena Vista Steel Company, at Buena Vista, Va., has let the contract for the masonry of that company's steel plant.

A receiver has been appointed for the Mary Pratt Furnace Company, which had been in litigation for several months at Birmingham, Ala. W. T. Underwood was the petitioner, and the resisting parties were J. B. Wolfe and White. F. C. Nabers, secretary and treasurer of the company, was appointed receiver, and a bond was fixed at \$20,000. The object of this action is to sell the Mary Pratt Furnace. Mr. Wolfe owns about \$50,000 of the stock in the company.

For several weeks past machinery has been arriving at Glasgow, Va., for the Glasgow Iron Mill. There are three building, each 192 x 60 feet, two side by side and the third joined at the end, making a total length of 312 feet. The boiler shed will be 71 x 30 feet and will contain three batteries of three boilers each. The machine and carpenter shops additional will be 75 x 40 feet. The mill will contain 18 puddling furnaces, but the number of heating furnaces has not yet been determined upon; it will, however, be five or six. Fuel gas will be employed, but the method and the amount has not yet been decided upon. The company make the announcement that they will be manufacturing muck bar by the latter part of May.

Thos. Devlin & Co. of Philadelphia, during these dull times keep their large force of several hundred men as fully engaged as at any time within the past ten years. A recent feature of their business is a foreign demand for their malleable-iron fittings for steam and gas, which the buyers state are in many respects superior to those manufactured in Europe.

The Malleable Iron Company, at Chattanooga, Tenn., are preparing to add a steel plant to their works.

The Philadelphia Furnace, at Florence, Ala., is about completed, and will be blown in at an early date.

The capacity of the furnaces which Howard & Sears intend erecting at New Castle, Va., for the purpose of making steel by the Adams direct process, will be 100 tons per day.

Work will be early commenced on a foundry and pipe factory at New Birmingham, Tex.

It is reported that a nail factory will be started at Morristown, Tenn., at an early date. The parties who will operate the plant are from Ohio.

The stock house of the Radford Crane Iron Company's furnace at Radford, Va., is finished; the stoves are all up, and work has begun on the foundation for the draft stack. Work has begun on the engine house which is the only brick structure to be built.

The Shelby Iron Mill at Helena, Ala., which was damaged by a storm some time ago, has been repaired and is now in operation.

A despatch from St. Louis says that the Farmers Loan and Trust Company of New York, are about to protect bondholders by foreclosing mortgages to the amount of \$2,600,000 on the property of the St. Louis Ore and Steel Company. These are 6 per cent. bonds, \$1,000,000 on the Pilot Knob Mine, \$1,000,000 on the Vulcan Iron Works, and \$600,000 on the coal mines at Grant Tower and Carbondale, Ill. Interest on these has been defaulted since July, 1890, when E. A. Hitchcock was appointed receiver. The failure was directly due to the exhausting of the ore body.

The puddling department of A. & P. Roberts & Co., Pencoyd, Pa., have been closed down. The men demand that the company sign the Amalgamated scale, while the firm insist upon the prices of the scale of the Philadelphia city mills. The other departments of the works will be put on five days per week, Saturday being given over to repairs instead of Sunday.

The differences at the Vulcan Iron Works have been satisfactorily adjusted, and the rolling mill and foundry are again in operation with full forces. There is no change in the state of affairs on Belle Isle. It was reported at one time that there was additional trouble at Hall's Iron Foundry, but the proprietors of that establishment said they knew nothing of it.

The Lynchburg National Bank at Lynchburg, Va., advertises for sale to the highest bidder, on the 18th inst., 13 \$150 first mortgage, second series 6 per cent. bonds of the Virginia Nail and Iron Works Company. These bonds were placed with the bank as collateral security for two notes.

James McKinney & Son, architectural iron workers, Albany, N. Y., put in all the iron

work in the new building just opened by the G. H. Hammond Dressed Beef Company on Broadway. The tracks, which are supported by ornamental iron bars, used to run the beef on, are the most unique in their section. The outside iron work is also of handsome workmanship.

The Pioneer Furnaces at Thomas, Ala., near Birmingham, are again making excellent records. The April product was 8135 gross tons for two furnaces, a very good showing on Alabama materials.

The Llano Improvement and Furnace Company have been organized at Llano, Texas. They have contracted for the building of a 125-ton furnace.

It is hoped that in a few weeks the plant of the Watts Steel and Iron Company, at Middlesborough, Ky., will be in active operation.

The St. Louis stockholders have purchased the furnace built at Paducah last year, and will put it into operation. This furnace has been lying idle since its completion, owing to suits occasioned by differences among its stockholders.

A new plant has been established at Harriman, Tenn., for the purpose of manufacturing wrought iron direct from the ore. The Harriman Wrought Iron Company is the name of the new organization.

The Florence Iron Works, with a capital stock of \$10,000, have been incorporated at Florence, S. C. The incorporators are R. C. Commander, James Allen, P. A. Wilcox and others.

The steel works of the Union Steel Works of Louisville, Ky., are to be removed to Lexington, Va. Work has already commenced on the new plant.

Another iron furnace is to be built by the Radford-Crane Iron Company of Radford, Va., as soon as the completion of the one now in course of construction.

The improvements and repairs which have been going on for some time at the coal furnace at Sheffield, Ala., have been about completed, at a total cost of \$30,000.

It is stated that the West End Furnace, at Roanoke, Va., will shortly shut down in order to inaugurate some necessary repairs.

The Pulaski Iron Company, at Pulaski City, are putting in a new blowing engine.

The Carbon Iron Company, Pittsburgh, have leased the plate mill at the works of the Springfield Iron Company, Springfield, Ill., and will ship ingots from Pittsburgh to be rolled into steel plates. The Carbon Company have a contract for 4000 tons of plates to be used in the construction of a Government cruiser to be built in San Francisco.

Leesport Furnace, at Leesport, Pa., which has been undergoing repairs since last fall, will be relighted in about two weeks.

The rolling mill of the Keystone Iron Works, Reading, Pa., has resumed operations after an idleness of over three months.

The nail mills of the Cumberland Nail and Iron Company, at Bridgeton, N. J., have shut down for a week.

The Riverside Iron Company, at Wheeling, W. Va., are preparing to build an addition 200 x 100 feet to their tube works.

The plant of the Etna Iron Works at Ironton, Ohio, will be offered at public sale on May 1 next. It consists of two blast furnaces, a live furnace 86 x 18 feet in size and Blanche furnace and alternate stack, 86 x 18 feet in size, the machinery at the plant being sufficient to operate only one stack at a time. The capacity of the plant is about 30,000 net tons of foundry pig iron per year.

The stockholders of the Standard Iron Company of Norristown, Pa., have received notice from the treasurer of that concern that under the decree of the court 33 per cent. of their stock would be repaid to them on application. The company was organized about nine years ago with a fully paid capital of \$750,000, and was in operation for less than a month. About two months ago application was made to the court for an order dissolving the company. Such a decree has now been made pursuant to a statement filed by a committee of three stockholders appointed to make a distribution. It is presumed that another and final distribution of about 20 per cent. can be made after the sale of the company's real estate.

The furnace of the Crane Iron Company, at Catawissa, Pa., is to be rebuilt, the plans for an enlarged modern furnace having been accepted by the firm and orders given for the commencement of the works. When completed the furnace will be a most complete one in every respect.

On April 21 an application for a charter will be made for the Cold Rolled Steel Company of Pittsburgh, for the purpose of engaging in the manufacture of iron and steel and other materials. The incorporators are W. H. Nemic, H.

H. Jack, James W. Tyson, Jr., W. J. Howard, Jr., and Samuel B. Shoemaker, all of Pittsburgh.

On April 17, William J. Lewis, Henry Lloyd, Cephas Taylor, Wm. J. Lewis, Jr., and Edgar K. Stephenson of Pittsburgh will make application for a charter for the Linden Steel Company of Pittsburgh. The new concern will succeed the Linden Steel Company, Limited, of that city, the intention being to change the present firm from a partnership to a corporation.

Rosena Furnace, at New Castle, Pa., operated under lease by the Oliver Iron and Steel Company of Pittsburgh, has been idle since February 12 last on account of the coke strike. We are advised that the furnace will resume operations as soon as a supply of coke can be procured.

At a conference held on Thursday, April 2, between representatives of the firm of Carnegie, Phipps & Co., Limited, proprietors of the Homestead Steel Works, at Homestead, Pa., and the Amalgamated Association of Iron and Steel Workers, the scale of wages to be paid the men for the three months commencing April 1 and ending July 1, 1891, was arranged. The wages of the tonnage men at this plant are based on the selling price of 4 x 4 inch steel billets. It was found that the average price of billets of this size during the first three months of this year was \$25.50, which will necessitate a reduction in the wages of the men of 5 1/4 per cent. The wages for the three months ending March 31 were based on billets at \$27 per ton. This is the lowest average price for steel billets for any three months since July 1, 1889, when the present agreement went into effect for three years. The minimum base of the scale is \$25.

Machinery.

The Leland Car Heater and Steam Coupler Company have been incorporated with a capital of \$40,000 to manufacture car heaters and steam pipe couplings at New York or vicinity.

The Middletown Car Works, at Middletown, Pa., will shortly resume operations, a large order for gondola cars having been received.

The Fort Valley Machinery Company have been organized at Fort Valley, Ga. The company have a capital of \$10,000, and will manufacture all kinds of machinery and agricultural implements.

A company with a capital of \$100,000 have been organized to build boiler and engine works at Big Stone Gap, Va.

What promises to be another long strike has been inaugurated by the Iron Molders' Union of San Francisco. The molders in the Pacific Rolling Mills have quit work, and this is said to be the first move of the union in the new campaign.

The Worthington Hydraulic Pump Works Company of Brooklyn, N. Y., have begun the erection of a new foundry at Elizabeth, N. J. There will be two buildings, 143 x 343 and 93 x 200 feet, and operations are expected to begin by July 1.

The Linn Iron Works, Birmingham, Ala., belonging to the Tennessee Coal, Iron and Railroad Company, were consumed by fire on the night of March 28. These works, which were used for the repairing, &c., of the company, as well as doing a foundry business, are to be rebuilt at once.

Champion Blower and Forge Company of Lancaster, Pa., inform us that their sales for the first three months of 1891 show a gain of over 20 per cent. above that of last year. The increased demand is not confined to any particular specialty, but covers their entire line of manufactures.

The Baker Iron Works of Los Angeles, Cal., have closed a contract with the City of Santa Anna for a complete system of water works. The contract price is \$58,000, and the entire work is to be completed within six months.

Work on the machine shops and foundry, at Bristol, Tenn., is progressing. The new machinery is all in, and it is very probable that the plant will be ready for operation by May 1.

The capacity of the boiler works, at Birmingham, Ala., has recently been doubled. The proprietors of this plant are Messrs. Crellin & Nalls.

The Dustin-Hubbard Mfg. Company, at Fort Payne, Ala., have changed their name to the Fort Payne Machine Works. Under the new organization J. P. Dornvirtha is the president and N. Whalley vice-president. Additional machinery has been put in and the plant will soon be in operation.

Roundhouses and machine shops are shortly to be erected at Central City, W. Va., by the Huntington and Big Sandy Railroad Company.

The Old Eagle Foundry, at Little Rock, Ark., has been leased by D. E. Jones & Co., who intend manufacturing their own fans for their sailor cotton elevators.

There is a prospect of engine works being erected at Norfolk, Va., as it is reported that parties are corresponding to that end. Information can be obtained by applying to the Secretary Chamber of Commerce.

A factory has been started at Blacksburg, S. C., by H. G. Hall for the sole purpose of manufacturing his patent loop-band machine.

The manufacture of agricultural implements has been commenced at the shops of the Bessemer Machine and Foundry Company, Bessemer, Ala. This company intend enlarging their plant and putting in additional machinery.

The Cheraw Machine Works Company, with a capital stock of \$35,000, have been incorporated at Cheraw, S. C., by J. W. McKay, W. R. Godfrey and others. This company will operate machine shops.

J. M. Luken has purchased an interest in the Russellville Iron Foundry and Machine Shops, at Russellville, Ark., and this plant is to be considerably enlarged.

Work has commenced on the foundation of the Graham Plow and Foundry Works, at Graham, Va.

Negotiations were successfully concluded recently between the Staunton Development Company, at Staunton, Va., and A. J. Sweeny & Son of Wheeling, W. Va., for the removal to Staunton of the works of the last-named firm. This establishment includes a foundry and machine shops, and the manufactures include steamboat machinery and structural iron works. The new building at Staunton will be a foundry building 100 x 100 feet, a machine shop 150 x 100 feet, boiler house and shops 60 x 100 feet, pattern shops 60 x 100 feet, engine house 20 x 100 feet, sheds 20 x 80 feet. The plant will occupy 40,000 square feet of floor space.

The bankers and business men of the city of Waco, Texas, have taken about \$100,000 worth of stock in the Lone Star Cotton Picking Machine Company recently organized in that city, and this money will be applied to the building of a factory and the purchase of machinery for the manufacture of the pickers.

Chester Foundry and Machine Company of Chester, Pa., besides important work in connection with the building of new blast furnaces in Tennessee, are actively engaged on hydraulic cranes and riveters, with the accumulators, for boiler shops, &c. They are running full force of hands, and report the outlook as fairly encouraging, although there is less new business offering than there was some time ago.

Wilfong Brothers of Philadelphia continue to be quite busy on boiler work, but are more particularly so on tanks for galvanizers.

The Reynolds Iron Works of New Orleans, La., with a capital stock of \$40,000, have recently been incorporated as the Reynolds Iron Works Company, Limited. W. H. Reynolds is the president of the company and J. S. Reynolds is the secretary.

The Drop Hammer Forging Company of Akron, Ohio, are exceedingly busy at present. Their specialties are cold chisels and solid punches, pitman rods and peculiar shapes in iron, steel or copper. Special tools are made to order. The officers are as follows: Jos. Cook, president; J. D. James, secretary and treasurer; M. F. Christenson, superintendent.

The Britton Patent Leveling Machine, for straightening sheets and plates, invented and manufactured by J. W. Britton of Cleveland, is getting into very general use in this country and is meeting with much favor abroad. In the United States they have been introduced into 32 works and in England into 10. One of the machines was shipped to Liverpool the past week. The new galvanizing works now being built in this country are making them a part of their equipment, as such a machine is found to be almost indispensable to meet the demands of the trade for level sheets. In fact the consumers of black sheets are also hastening the general adoption of a leveling apparatus in the sheet mills by their decided preference for sheets so treated.

It is reported at Hornellsville, N. Y., that the Erie contemplates the erection of a large foundry building on the site of the old oil house, water tank and gas house of the Susquehanna.

Stephen S. Brown of Troy, N. Y., has invented a rotary pump. The pump will be manufactured in Troy.

Hardware.

It is reported that W. B. Brady contemplates the establishment of a plant at Austin, Texas, for the manufacture of his nail-driving tool.

J. M. Stover, B. A. Betts, J. R. Rohrer and others have incorporated the Coleman Fruit Evaporation and Preserving Company, at Hagerstown, Md., for the purpose of manufacturing evaporators for curing fruit.

The Standard Mfg. Company, with a capital stock of \$5000, with privilege of increasing to \$50,000, have been incorporated at Martinsburg, W. Va. The incorporators of the company are R. G. Surbridge, C. D. Mattheri, B. R. Harrison and others. The purpose of the company is the manufacturing of bicycles.

The Southern Horse and Mule Shoe Company have been organized at Strasburg, Va., with a capital stock of \$300,000. The company will proceed at once to erect machine shops.

The Harriman Hoe and Tool Works, of Harriman, Tenn., are now in operation. The management of the works is in the hands of J. B. Durrell of Chattanooga.

A tack factory has recently been established at Harriman, Tenn. It is now ready for business, starting with 40 employees. George B. Darrell is the manager.

A partnership has been formed at Port Jervis, N. Y., by James McCombs and Christian Wagner, to engage in the manufacture and sale of Wagner's patent filter and Wagner's household filter. These articles are the inventions of Mr. Wagner, who is also the inventor of an improved pinch bar, which is highly commended by leading railroad men.

Hamblin & Russell Mfg. Company, Worcester, Mass., were damaged by fire on the 28th ult. The loss was in the neighborhood of \$7000, fully covered by insurance.

The Diamond Tack Factory at Raynham, Mass., was destroyed by fire on the 3d inst. The loss is estimated at \$25,000, on which there is an insurance of \$18,000. The fire was probably of incendiary origin.

Hopkins & Dickinson Mfg. Co., Brooklyn, N. Y., and 83 Reade street, New York, have just secured the contract to furnish the hardware for the McIntyre Building, Eighteenth street and Broadway, New York, and they are now furnishing the Montauk Club, Brooklyn, the Jersey Central Building, the Columbia Building and the Delmonico Building, New York City.

Miscellaneous.

The shipyard and marine railway plant belonging to the Salisbury Marine Railway and Shipbuilding Company is being removed from Shadpoint, Md., to Salisbury.

A company was recently organized at Baltimore, Md., under the name of the Bowne Pneumatic Signal Company for the purpose of introducing R. T. Bowne's patent pneumatic railroad crossing signal. R. T. Bowne is the president of the company; J. C. Gittings, vice-president; A. R. White, secretary, and C. L. Howell, general manager.

The Virginia Car Company, with a capital stock of from \$100,000 to \$1,000,000, have been incorporated at Glasgow, Va. Col. A. S. Burford of Richmond is president, and among the directors are ex-Gov. FitzHugh Lee and Col. W. A. Anderson.

Work has been commenced on the building for the new brass works at Buchanan, Va., and will be prosecuted with vigor until completed.

Work is now rapidly going forward at Bridgeport, Ala., on an iron pipe foundry and steel car works, while negotiations are pending for the establishing of other industrial plants.

It is reported that the Florence Stove and Mfg. Company at Florence, Ala., is to have its plant improved and new machinery put in for the manufacture of plows, by the parties who have recently purchased a controlling interest in the works.

The construction of the building for a large pipe factory at Abington, Va., has been let by contract. The machinery has arrived, and the work is being rapidly pushed.

It is reported that car works will, at a very early date, be established at Memphis, Tenn.

Negotiations are pending at Norfolk, Va., between the Norfolk Industrial Development Company and the American Steel Barge Company looking to the establishing of a ship yard by the latter company at some point on the Norfolk harbor.

The Midway Iron Mills, near Roanoke, will go into operation shortly.

The car-wheel works of the United States Rolling Stock Company, at Decatur, Ala., are now in operation, running to their full capacity with a daily output of 133 wheels.

It is reported that the Car Works of Rochester, N. Y., will remove their plant to Johnson City, Tenn., where they will expend \$100,000 in establishing it.

The West Point Iron Works, to establish iron works, electric-light plants, construct water works, &c., have been incorporated at West Point, Ga., by W. C., L. and E. F. Lanier, now engaged in operating the West Point Foundry. The new corporation have a capital stock of \$50,000.

TRADE REPORT.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 50 Dearborn street, CHICAGO, April 8, 1891.

As yet there is nothing encouraging to report in the immediate outlook. Crude Iron is dull, with no change in prices, but finished Iron is weak and lower and manufacturers are anxiously seeking for orders. The only cheering feature to report is the advent of pleasant weather. A few days of sunshine will greatly stimulate outdoor activity and must have a beneficial effect on general business. A radical improvement, however, is not expected until crop prospects are pretty thoroughly settled, which will bring the railroads again into the market for large quantities of Iron and Steel products.

Pig Iron.—The supply of softeners is getting scarcer, and makers are trying to get more money for their product, but consumers do not respond very willingly, as they argue that the coke strike is about over or soon will be, when more furnaces will be blown in. Ohio silvers are being sold quite freely in 100 to 500 ton lots by such makers as are still taking old prices. Southern Coke Iron is quiet but steady, except warrant Iron, which is offered at lower figures than Iron of the grades covered has ever before been sold here. Buyers of warrants report annoying difficulties in getting Iron shipped which they have ordered to be forwarded. Strong Coke Foundry and Lake Superior Charcoal are moving in carload lots only, but some figuring is being done on round lots of Charcoal. The local foundries are still very short of work, and not taking in Iron which they had ordered. We quote:

Lake Superior Charcoal	18.00 @
Local Coke Foundry, No. 1	15.50 @ 16.06
Local Coke Foundry, No. 2	15.00 @ 15.50
Local Coke Foundry, No. 3	14.50 @ 15.00
Local Scotch	16.00 @ 16.50
Ohio Strong Softeners	18.50 @ 19.00
Southern Coke, No. 1	16.25 @ 16.75
Southern Coke, No. 2	15.75 @ 16.00
Southern Coke, No. 3	15.25 @ 15.50
Southern, No. 1, Soft	15.75 @ 16.00
Southern, No. 2, Soft	14.50 @ 15.00
Southern Gray Forge	14.50 @ 14.75
Tennessee Charcoal, No. 1	18.50 @
Alabama Car Wheel	22.50 @ 23.50
Coke Bessemer	17.00 @
Hocking Valley, No. 1	18.25 @ 18.50

Bar Iron.—Here and there a few orders are being picked up, but trade is generally very dull. Manufacturers report much trouble in getting buyers to specify. They are now working for business twice, first to get the order and then to get specifications. Prices are weak and lower. Small lots of Common Iron might be sold at 1.65¢, half extras, Chicago, but quantity sales have been made at 1.60¢, and jobbers assert their ability to buy even lower. Trade with car builders is at a very low ebb. Not only are orders small, but buyers are hammering prices. Quotations from store, 1.85¢ @ 1.90¢, half extras.

Structural Iron.—D. Forsythe Morris, agent for Phoenix Company, has secured the beam and column contract for the Wainwright building at St. Louis. Other large buildings will be let at St. Louis in the next two or three weeks. For some reason the awarding of contracts here hangs fire, but a great deal of business must shortly be closed in this line.

Sheets.—The situation is without any new features.

Plates.—Very low prices are being made by both Eastern and Western mills, but they are not inducing much business. Store trade is fair. Boiler Tubes are lower. Quotations are revised as follows: Nos. 10 to 14 Iron Sheets, 2.65¢ @ 2.70¢; Steel Sheets, 2.80¢ @ 2.90¢; Tank Iron, 2.50¢ @ 2.60¢;

Tank Steel, 2.60¢ @ 2.70¢; Boiler Tubes, 55% off, up to 2½ inches, and 60% off on greater. Other prices unchanged.

Track Supplies.—Steel Rails have not been called for in large quantities, but the tonnage being entered is gradually creeping up. The business in sight is assuming better proportions, and the belief is now entertained by manufacturers that a large volume of trade will come up as the season advances. Large lots are still being taken at \$31, with the usual advance for small lots and carloads. More Splice Bar orders are in the market, and quotations on Iron range from 1.85¢ to 1.90¢. Steel Splices are difficult to quote, as trade in them is irregular. Spikes are quiet at 2¢ @ 2.10¢, while Track Bolts are a little weaker, Hexagon Nuts being quoted at 2.85¢.

Merchant Steel.—A fair trade is reported, but transactions in round lots are far apart. Prices are nominally as before, viz.: Open-Hearth Machinery at 2.30¢ @ 2.65¢, Spring at 2.50¢ @ 2.75¢, Tire at 2.30¢ @ 2.60¢, and Bessemer Bars at 2.20¢ @ 2.30¢.

Old Rails and Wheels.—Small quantities of Old Iron Rails are offered. The supply is quite limited, but at the same time the demand is light. Railroads ask \$23.25 @ \$23.50, but consumers assert that they can purchase at \$22.75. Old Steel Rails are very dull, with quotations, of \$18.50 @ \$17, according to length. Car Wheels are quiet; large lots would hardly bring over \$16.50, but carload buyers would probably have to pay \$17.

Scrap.—A little movement in Wrought Scrap is reported, but lower grades are neglected. The dealers are well loaded with stocks, and are making strong efforts to move them, but without success. Sales of Fish Plates are noted at \$21. Selling prices per net ton are about as follows: No. 1 Railroad, \$18.50; No. 1 Forge, \$18 No. 1 Mill, \$13.50 @ \$14; Fish Plates, \$21; Axles, \$24; Pipes and Flues, \$12.50 @ \$13; Horseshoes, \$18; Cast Borings, \$8 @ \$8.50; Wrought Turnings, \$11.50; Axle Turnings, \$13; Machinery Cast, \$12; Stove Plates, \$8.50 @ \$9; Mixed Steel, \$11; Coil Steel, \$15; Leaf, \$16; Tires, \$18.

Metals.—Copper is considerably stronger now than it was last month, but quotations have shown no change for the past week. Casting brands are held at 11.75¢ and Lake at 14.25¢ in car-load lots. Spelter stands at 5¢ @ 5½¢, according to brand.

In Pig Lead dealers state that the dullness existing in other branches of trade extends also to the Lead industry. Manufacturers both West and East, having little faith in the stability of prices, have taken on metal in meager quantities, and Lead coming forward has been more than sufficient to supply the demand. Values have weakened somewhat at the several centers, and producers show some disposition to force sales. The market here has been very dull. Consumers have bought only sparingly, and the out of town inquiry was light. Early in the week's quotations were fairly steady at 4.15¢ and 4.17½¢, but the closing is weaker, 4.15¢ asked, 4.10¢ bid. The average price of Pig Lead in Chicago for the month of March, as reported by Everett & Post, is 4½¢, against 3.82½¢ for the same period last year.

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, Pa., April 7, 1891.

The opening of the second quarter of the year's business is in many articles at the lowest figures known for some years past, and so far as now appears, without any immediate prospect of improvement. There are some signs of increasing activity, however, so that it may be that the turning point is nearer at hand than peo-

ple are inclined to expect. Good features are not entirely absent, by any means, and there is a possibility of their rapid development. This is beginning to be seen in some other departments, and if maintained must certainly be sympathized in by the Iron trade. It is an accepted maxim that Wall street always discounts the future, and if that be true better times are in store for the Iron trade, if a 5 to 10% advance in stocks within 20 or 30 days counts for anything. Of course, it is just possible that this may be one of the periodical spurts, but it doesn't look like it. Railway earnings, based on more uniform as well as on more remunerative rates, are showing up wonderfully well, and as the average this year is larger and prices very much better, the most sanguine expectations are indulged in as regards the volume and character of business later on in the season. The feeling is unanimous, that with good crops at good prices, not only the railways but every kindred interest will share in the agricultural prosperity.

As regards Iron more particularly, the position, to say the least, is an eminently safe one. Prices are about as low as they are likely to go; there may be a temporary decline before the reaction gets under full headway, but the most extreme pessimist has no strong expectation of seeing materially lower prices than those now ruling. Another strong feature is that stocks of both Pig and Finished Iron are in unusually small compass. This is due partly to the fact that prices have been steadily on the decline for the past six months, so that no one carried more stock than was necessary, and partly to the stringency in money, which prevented many from carrying as much as they might have done under more favorable circumstances. The position therefore is a favorable one for improvement, although there may be—and probably will be—a good deal of backing and filling before it gets well under way. The Coke strike has to be settled up, and the labor scale arranged, before any decided movement is made, and that may require more time than is generally expected. Still, taking everything into consideration, there appears to be ample grounds for the belief that a much better market will be met before long. It is only a question of time, how long will depend upon developments from week to week, which from this time forward will be carefully watched by all interested parties.

Pig Iron.—If there is any change in the condition of the market, it will require extraordinary discrimination to show where it is. Some talk it a little firmer, some talk it less active, but no one claims any change in selling prices. For all practical purposes, therefore, the market may be called steady at prices recently ruling. The offerings of good Irons are not excessive, neither is there any demand beyond what is ordinarily met with at this season, so that the outlook is about as featureless as it has been for several weeks past. Sales are almost exclusively in small lots, the aggregate amount is considerable, but because of the retail way in which it is done, it looks smaller than it really is. Those who in ordinary times take 500-ton lots take 100, and those who usually take 100 take car loads, and so it goes all the way through. Buyers of 1000 to 5000-ton lots are in the market at prices ruling some time ago, say, 50¢ to \$1 less than the present asking prices, but their bids are so low to receive serious attention, so that for all practical purposes they are out of the market. Deliveries on all contracts are being taken pretty freely, however, and from present indications buyers will be ready for renewals quite as soon as sellers are. To-day's quotations for lots delivered in consumers' yards are about as follows:

Barb Wire.—There is not the demand possibly there was a month or more ago, but prices are maintained. We continue to quote syndicate rates as follows: Glidden Painted, 2.85¢; Galvanized, 3.40¢; Four Point, Painted, 2.80¢; Galvanized, 3.35¢, all in car-load lots, f.o.b. at makers' works.

Steel Plates.—There is a fair business at unchanged prices. Fire Box, 4.25¢ @ 4.50¢; Flange, 2.75¢; Shell, 2.55¢; Tank, 2.20¢.

Merchant Steel.—Business is still reported light, and for desirable orders prices quoted might be cut somewhat; Bessemer Tool Steel, 7¢ @ 8¢; do. Machinery, 2.5¢; Crucible Machinery, 5¢; do. Spring Steel, 4¢; Tire Steel, 2.20¢; Steel Bars, 2.20¢.

Wire Rods.—The market is reported easier, with some manufacturers soliciting business; we now quote at \$37, \$37.50 and \$38, f.o.b. at makers' mill according to character of order and delivery.

Billets and Slabs.—The market for Billets continues dull and prices weak and drooping. We quote at \$25.50 to \$26. although it is said that Wheeling has offered to sell at \$25.25, on cars there. The freight eastward is the same from Wheeling as Pittsburgh. Some of the mills here are still pretty busy on old contracts, but others again are anxious for business.

Old Rails.—There is very little call for either Old Iron or Steel Rails, and while the market is dull prices remain about as last quoted. Old Iron Rails, \$24 @ \$24.50, and Steel, \$17.50 @ \$17.75 for short and mixed pieces. It is expected that the demand will pick up as the season advances.

Railway Track Supplies.—Business continues light. Prices remain unchanged: Spikes, Iron or Steel, \$2.05, 30 days, f.o.b. at makers' works; Splice Bars, 1.90¢ @ 2¢; Track Bolts, 2.80¢ with Square and 2.90¢ with Hexagon Nuts.

Steel Rails.—There has been little new business reported here of late. The Edgar Thomson Works have not yet been started up, and it is hard to say when they will be.

Old Material.—There is a fair demand for No. 1 Railroad Wrought Scrap, but prices are a shade lower, \$20 @ \$20.50, net ton; Iron Car Axles \$27 @ \$27.50; Cast Scrap, \$14 @ \$14.50, gross; Old Car Wheels, \$17; Steel Rail and Bloom Ends, \$17 @ \$17.50.

The McClure Coke Company have removed their offices from the Lewis Block, Pittsburgh, to the German National Bank Building, corner of Sixth avenue and Wood street, in that city.

The Pittsburgh Iron and Steel Engineering Company, formerly located in rooms 615 and 616 in the Lewis Block, Pittsburgh, Pa., have removed to rooms 309-312 in the same building, formerly occupied by the McClure Coke Company.

L. E. Block & Co. have opened offices in the Hamilton Building, Pittsburgh, Pa., and will do a general brokerage business in Iron and Steel.

J. B. Booth & Co., brokers in Iron and Steel, formerly located in Room 803 Hamilton Building, Pittsburgh, Pa., have removed to Room 529 in the Standard Building, on Wood street, in that city.

W. P. Snyder & Co., brokers in Iron and Steel, have removed their offices from Rooms 305 and 306 Lewis Block, Pittsburgh, to the new German National Bank Building, in that city.

The Columbia Iron and Steel Company, works at Uniontown, Pa., who made an assignment last week, it is expected will be all right again soon, as a reorganization of the company has taken place. This company have some good contracts booked, including a large one for beams for the

new Masonic Temple at Chicago, and if given a little time, it is believed, will come out all right.

Louisville.

LOUISVILLE, KY., April 6, 1891.

Pig Iron.—The market has been very quiet and but a small amount of Iron sold; a few sales of Close Silver Gray, basis of \$10.75 furnace, one sale of about 4000 tons basis of \$10 for Gray Forge Birmingham; 1200 tons of Birmingham Gray Forge was offered at a shade under \$10 and only a portion of it taken; same, however, was for prompt delivery and prompt cash, and was made by a furnace out of blast, who wished to close out Iron in yard. Southern Car Wheel Iron is shown slightly better, and a sale was made fully 75¢ over what the same quality of Iron had sold for in November, the price being in the neighborhood of \$20 Louisville; same, however, is yet very low, and producers claim that they but get the cost of making. We quote:

Southern Coke, No. 1 Foundry...	\$14.50 @ \$15.00
Southern Coke, No. 2 Foundry...	13.75 @ 14.25
Southern Coke, No. 3 Foundry...	13.25 @ 13.75
Southern Coke, Gray Forge.....	12.75 @ 13.25
Southern Charcoal, No. 1 Foundry	16.00 @ 17.00
Southern Car Wheel.....	17.00 @ 20.00

Cincinnati.

(By Telegraph.)

Office of The Iron Age, Fourth and Main Sts., CINCINNATI, April 8, 1891.

Pig Iron.—The local market is dull and weak, with prices lower. No new contracts are being placed, but there is a fair movement on account of old orders. No 1 and No. 2 Southern Coke Foundry Iron is scarce, and held at \$12 @ \$13 and \$11.25 @ \$11.50 respectively, but No. 3 Foundry is offered at \$10.50 to \$10.75, and Gray Forge is difficult to sell at \$10. In fact, some sales have been made at \$9.65 @ \$9.75, and Warrant Iron is difficult to sell at \$9.60. Mottled is scarce and about equal to Gray Forge. Car-Wheel Iron is dull and neglected.

Cleveland.

CLEVELAND, April 6, 1891.

Iron Ore.—There is nothing new to report in the way of sales. There is talk of \$1 charters from Ashland, and vesselmen do not deny that rates for transportation founded on such a basis are probable. Reports from the Lake Superior mines indicate slight activity and no very extensive preparations for the summer. As a matter of fact an output of only 4,500,000 or at the most 5,000,000 tons is looked for, and the enormous quantities of Ore now on the lower lake docks would seem to indicate that even these figures are too large. Eastern furnacemen are earnestly endeavoring to obtain prices but the Oremen are unable to even make a guess.

Pig Iron.—The excitement incident to an unusually important local election has temporarily diverted attention from the Iron market, which has been rather weak and uncertain for 10 or 12 days past. Many of the local offices have been closed for the past two or three days, while those in charge have taken an active interest in the contest for municipal officials, into which national issues have been introduced in a mild degree. The demand for Pig Iron seems to be exceedingly light, buyers restricting their orders to their imperative needs. Dealers who have been holding small lots of Bessemer at \$17 have let some of their holdings go during the past week at about 50¢ less per ton. Buyers seem confident of additional reductions.

Old Rails.—Not much is being done, although about \$24 per ton is paid when any sales are made. A better market is looked for soon.

Scrap.—The market is only moderately active, with \$20.50 asked for No. 1 Railroad Wrought, \$18.50 @ \$14 for Cast Scrap, \$17 for Old Car Wheels and \$27 for Old Iron Axles.

Barb Wire.—A very fair demand is reported. No change in quotations.

Manufactured Iron.—The market is not very firm, and prices have not changed for several weeks. Common Bar is quoted at 1.65¢. No. 27. Sheets at 2.85¢.

Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., under date April 6, 1891, say: While business continues dull, and for the most part is confined to small orders, yet some few are being booked for quantities ranging from 300 to 500 tons, and occasionally one as large as 1000 tons is secured. Notwithstanding these few bright spots, the market generally is considered a dull one. The call for Foundry Irons is not very great, and the majority have contracts running for some months yet. The orders received are for prompt shipment. The impression is very general that prices on Coke Iron cannot well advance and buyers feel pretty secure in waiting, as they think when the valley furnaces get to blowing again there will be a surplus of Foundry Irons, and prices on Southern Iron will fall back to figures made some months ago, and possibly a shade lower. Lake Superior Charcoal is generally conceded to be as low as it can be produced, and if any change is made it must be to a higher basis. With a quiet market we repeat quotations of last week.

Lake Superior Charcoal, all numbers.....	\$18.50 @ \$19.00
Lake Superior Coke, Bessemer.....	18.00 @ 18.50
Katahdin (Maine Charcoal).....	23.00 @ 24.00
Lake Superior Coke Foundry, all ore.....	18.00 @ 18.50
Ohio Blackband (40 per cent.)...	18.00 @ 18.50
Southern No. 1.....	16.25 @ 16.75
Southern Gray Forge.....	14.75 @ 15.25
Jackson County (Ohio) Silvery.....	18.25 @ 18.75

Financial.

Easy money, promise of large crops of winter wheat, the probable culmination of adverse legislation in the West as to railway tariffs and large exports of grain, provisions and cotton—these all are factors conducive to a more cheerful tone in business circles. On the other hand the season is backward and movements of merchandise generally afford little indication of an early spring opening. The Italian incident excited little more than a temporary alarm and foreign advices both from Berlin and Paris are more hopeful for the preservation of peace in Europe. Russia has negotiated a new loan of \$100,000,000 for the extension of railways, as may be assumed, for strategic purposes. Italy, however, finds that war rumors are no help to her proposed loan in France. The April quarterly disbursements in payment of interest and dividends due in New York by numerous corporations, make an aggregate of at least \$30,000,000, to which must be added payment of interest on the outstanding 4 per cents and various securities. The effect is to release large sums which become available for speculation or re-investment. The crop outlook is particularly cheering. The Nebraska State Board of Agriculture say prospects are superior to those of any year in the history of the State. In Dakota seeding is in progress. The Kansas State report shows a winter wheat acreage of 2,033,000 acres, an excess over last year of 527,000 acres. In Minnesota the spring wheat region is in excellent condition. Looking abroad, the European yield indicates a serious falling off, France and Russia being below the average. The London Standard predicts for English farmers the highest price for many years.

The stock markets at the close show more activity. Sugar refiners' stock advanced on the expectation that low prices of sugar would stimulate the process of manufacturing and granger stocks were helped by the defeat of the maximum freight rate bill in Nebraska. Another event was the declaration of a semi-annual dividend of 4% on National Cordage common, and a quarterly dividend of 2% on the preferred. The earnings of the Cordage Company are asserted to have been \$1,100,000 net in six months. Reports of the engagement of more gold for Europe at times imparted a more heavy tone. A rise in Sugar Refiners' was explained by the statement that the Havemeyers and Spreckels have formed the Western Coast Refining Company, and that, while production will be regulated, the deal does not include the Spreckels refinery in Philadelphia. Saturday's unfavorable bank statement occasioned an irregular decline. Monday's dealings were influenced by better prices in London. Sugar stock was stronger on the statement before the Senate Committee that the \$20,000,000 received from the constituent corporations were derived from legitimate earnings. Long Island was not affected by reported efforts on the part of the Vanderbilts to control the property, statements to this effect being positively denied.

The market was not disturbed by the engagement of \$1,300,000 in gold for Wednesday's steamer. Exports of merchandise for the week were \$5,696,000, and the imports \$10,198,000. Total exports from New York since January 1, \$94,945,000; total imports, \$144,775,000.

The Hide and Leather National Bank will be in the new ten-story Healy Building, Gold and Ferry streets, with a paid-up capital of \$500,000, divided into 5000 shares of \$100 each, which were quickly subscribed. Charles B. Fosdick is president.

Money was not disturbed by the April settlements. The demand for time contracts was small. Rates either on good collateral were 4½% for 60 to 90 days, and 5 for four to six months. Commercial paper was dull. Rates were 5 to 5½% for 60 to 90 day indured bills and 6 to 7 for good single names. The bank return showed a loss of \$2,005,400 cash and of \$2,052,675 in surplus reserve, and this item now stands at \$6,389,975. Loans expanded \$2,400,300. It is supposed that the drain on the banks is about over. London is believed to be recovering from her Argentine troubles, but the Bank of England reserve is about \$10,000,000 below the figures one year ago, and some apprehension is expressed that more demands may come from Brazil or some other quarter, making it necessary to protect its stock of bullion. The banks of France and Germany alike want more gold.

United States bonds are steady, as follows:

U. S. 4½%, 1891, registered.....	102
U. S. 4½%, 1891, coupon.....	102
U. S. 4%, 1907, registered.....	121½
U. S. 4%, 1907, coupon.....	122
U. S. currency 6%, 1895.....	111

Sterling exchange is firmer, posted rates, \$4.87 @ \$4.89½.

Business has been moderate in most directions. Holders of raw sugars are firm, the enormous quantities lately in bond having been quickly absorbed and new supplies are not near at hand. Prices of refined are firm on the old line of quotations. Speculation is strongest in grain and provisions with a fair export demand for flour, and there is free export business in spot wheat. Several orders are from Lisbon. The lowest rate this year so far on cattle shipments was that accepted at Philadelphia for Liverpool, or 22/6. Unfavorable spring weather has adversely affected the dry goods jobbing and retail

branches of trade, but all markets are in fair condition as to supplies. Buyers are looking for low prices. With jobbers the week was enlivened by large forced sales, usually of unpopular styles.

The International American Monetary Commission closed its sessions at Washington without being able to agree about the adoption of a uniform monetary system. It declares, in its report, that it would be a good thing if "a fixed ratio could be established between gold and silver," but it does not think that such an agreement could be secured "under present circumstances." The results of the monetary conferences of 1878 and 1881 were equally discouraging to the bi metallists.

New York.

OFFICE OF *The Iron Age*, 96-102 Reade street, NEW YORK, April 7, 1891.

The abnormal dullness continues in every branch of the Iron trade in this market. The only feature worthy of note is that the number of sellers is increasing who decline to make any further concessions to hold business, thus indicating that there is little room for a further decline. The only serious feature is the talk in the West that the valley furnacemen will soon become sellers at low figures—say \$12.50 for Forge and \$14.50 for Bessemer, at furnace. It is understood that some of them proclaim their ability to make a little money even at the low figures named.

American Pig.—This market is dull. Southern furnaces are reported to be weakening a little in certain grades, notably Mill Iron and No. 3. The extreme range on Northern brands is \$17 @ \$18 for No. 1, \$16 @ \$16.75 for No. 2 and \$14 @ \$15 for Gray Forge. Southern Iron sells at \$16.75 @ \$17.50 for No. 1, \$16 @ \$16.25 for No. 2 and \$14 @ \$14.25 for Gray Forge. Our monthly blast furnace report, printed elsewhere, shows a further enormous reduction in the current output.

Ferromanganese.—The market is very dull. Sellers of foreign are asking \$63.50 @ \$64, with a possibility of \$63. The American product is small at present, the Edgar Thomson Furnace being out.

Billets and Rods.—The market is dull and nominal. The Pittsburgh market is quoted \$25.50 @ \$25.75. There is some demand in this section for Ingots for rolling into structural shapes.

Steel Rails.—The market is absolutely lifeless, only one sale of 5000 tons having been closed during the week by a Pennsylvania mill. Few negotiations are progressing for particularly large lots. Rail sellers insist that a good deal of business must yet come out, both from the large lines for renewals and for the completion of roads upon which a good deal of work has already been done. Some of the mills are comfortably off with work, but none of them, so far as we can learn, are pushed to anything near capacity. Altogether, the amount of business placed thus far for this year's delivery has been very small. One estimate by good authority places it at less than 400,000 tons. It is a fact that a good many lines simply have not got the money to purchase the Rails which they need, and past experience has pretty well shown that the management of many roads does not hesitate to defer purchases for long periods, even if the only motive is to keep the net earnings at a respectable figure. The opinion is quite general in the Rail trade that no marked improvement can be expected for some months. We quote, \$30.75 @ \$31, at tidewater.

Manufactured Iron and Steel.—Some of the local mills report that they are well supplied with orders. Others are doing very little. Prices, notably in Plates, continue

weak. We quote Angles, 1.95¢ @ 2.10¢; Sheared Plates, 2¢ @ 2.25¢; Tees, 2.45¢ @ 2.75¢, and Beams and Channels, 3.1¢, on dock. Steel Plates are 2¢ @ 2.15¢ for Tank, 2.35¢ @ 2.6¢ for Shell, and 2.6¢ @ 2.7¢ for Flange, on dock. Bars are 1.7¢ @ 1.9¢, on dock.

Merchant Steel.—Reports of sharp cutting prevail. We quote Machinery Steel, 2.05¢ @ 2.15¢ base, and Tire Steel, 1.95¢ @ 2.05¢ base.

Rail Fastenings.—The market is weak. We quote Spikes, \$1.90 @ \$1.95, delivered; Fish Plates, 1.75¢ @ 1.80¢, delivered, and Bolts, 2.75¢ @ 2.90¢, delivered.

Old Rails.—The only sale of consequence reported is a lot of 1000 tons Old Steel, delivered at a Western point, at \$17, and 500 tons of Old Iron, similar delivery, at \$24.50. Small lots of Old Steel Rails have sold in this section at \$17, delivered.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, April 6, 1891.

Pig Iron.—The market continues in much the same condition as last noted. Demand is only moderate, and indications are that any early improvement is out of the question. Since our last report sales have been light and prices are shaded from 25¢ to 50¢ per ton, according to circumstances. There has been some warrant Iron sold during the week under review at private terms. The general condition of trade is not encouraging, and the outlook cannot be considered particularly bright. Consumers are only buying in limited quantities as their needs require, and apparently are not at all anxious about the future. The demand for finished product is light, although a better trade is looked for in the near future. Pipe manufacturers who are heavy consumers of Pig Iron are complaining for want of orders, and they are not likely to be in the market for some time to come. The general business in this section shows a falling off in comparison with last year, and while this condition of affairs cannot last long, the effect is felt in the sales of Iron. Looking the ground over carefully the situation is, to say the least, a complicated one, with the chances in favor of the buyer. We quote as follows for cash, f.o.b. St. Louis.

Southern Coke, No. 1 Foundry, \$16.00 @ \$16.25
Southern Coke, No. 2 Foundry, 15.00 @ 15.25
Southern Coke, No. 3 Foundry, 14.50 @ 14.75
Grav Forge..... 14.00 @ 14.25
Southern Charcoal, No. 1 Foundry..... 17.50 @ 18.00
Southern Charcoal, No. 2 Foundry..... 17.00 @ 17.50
Missouri Charcoal, No. 1 Foundry..... 15.50 @ 16.00
Missouri Charcoal, No. 2 Foundry..... 15.00 @ 15.50
Ohio Softeners..... 18.00 @ 19.00

Bar Iron.—There is no special change to note in this department since our last report. Car orders are scarce and mills are becoming anxious regarding the future. They are nearing the end of their order books and should the demand continue as it now is a lower range of prices will likely result, although it is questionable if mills can afford to quote much lower than the prices at present prevailing. We quote as follows: Lots from mill, 1.65¢, East St. Louis; jobbers quote 1.75¢ @ 1.80¢ from store.

Barb Wire.—Trade continues fairly satisfactory and prices are not cut to any extent. The weather is beginning to settle and outdoor work can now be pushed with vigor. An increased demand is looked for and mills are stocking up in anticipation of a heavy spring trade. Prices, as stated above, are fairly well maintained, as follows: Painted, from mill, 2.95¢; Galvanized, 3.50¢; carload lots, 10¢ per cwt. less than above prices.

Metal Market.

Copper—Various rumors of extensive sales of Lake Superior Copper for future delivery have had circulation. One of these was to the effect that orders were taken for several million lb at 14¢ per lb with guarantee of protection to the buyers in the event of lower prices ruling. Another had it that contracts were made at 13½¢, with no guarantee, deliveries extending through the year. Neither report was verified at the proper sources for information. It is strongly intimated, however, that 13½¢ was accepted for small quantities for prompt delivery, although some inquiry at 13½¢ for futures has been noted the past few days. Actual sales to the extent of 500,000 lb were reported at 13½¢ for prompt and 13½¢ for future delivery. Arizona Ingots have been obtained in small parcels at 12½¢, but that price could hardly be secured for round lots. Casting Copper has been moving at 11½¢ @ 11½¢, as to brand, but rather slowly. Returns from ten leading Lake Superior mines show a total output in March of 4926 tons, against 4483 during the corresponding month last year. The same mines produced 14,084 tons during the past three months, or 1452 tons more than during the first quarter of 1890. The Boston and Montana Company produced 6,125,000 lb during the three months, against 6,350,000 lb for the corresponding period last year.

Pig Tin.—The speculative transactions on the Metal Exchange during the week represent a total of about 500 tons, and on Thursday last prices were carried up to 20.40¢ for prompt and current month delivery. The buying was confined chiefly to two firms, one of whom is understood to control over 1200 tons in spots and futures at the present time. London, instead of affording the "bulls" any aid, has remained at a standstill, and the local manipulation does not appear to have attracted any outside clientele and jobbers do not appear to have been agitated in the slightest degree by the speculative maneuvering. To the contrary, one or two firms accommodated the speculators with something like 200 tons, and seem to have sufficient Tin at present to supply their regular trade at prices very close to those quoted on 'Change. Wednesday's market was firm but quiet. Spot prices were 20.30¢ bid, 20.40¢ asked, for 10-ton lots, and 20½¢ @ 20½¢ for jobbing quantities. May delivery was offered at 20.30¢, with 20.20¢ the best bid.

Pig Lead.—The market is weaker. Fairly full bids are made on single carload lots in quarters where highest quotations may do the most good, but smelters have offered with greater freedom the past week and at lower prices, indicating some anxiety to sell. About 500 tons have been placed, in lots of about 100 tons, at 4.30¢ @ 4.32½¢ and the inside price would be accepted at this writing. From the West there were offers to sell on the basis of 4.32½¢ for New York delivery. Single carload lots quoted at 4.32½¢ @ 4.35¢, on the spot.

Spelter.—The market has been a shade weaker, under the influence of slow demand and slightly more pressure to sell. On prime Western 5.10¢ is the popular quotation for carload lots, prompt shipment, but sales have been made at 5.05¢ and buyers are not bidding over 5¢ at the present time. St. Louis quotes 4.80¢ there.

Antimony.—Apart from the ordinary jobbing sales there is little movement and prices show but slight variation. Hallatt's is quoted at 15½¢, LX at 16½¢ and Cookson's at 17½¢ @ 17½¢, in wholesale quantities.

Tin Plate.—The market has remained positively dull. Large consumers are well supplied from current arrivals, the quantity passing into jobbers' hands is heavy, and the demand from all sources is light. No absolute pressure to sell is noticeable, but cheap lots come out at intervals and prices are unsettled. The importations at this port alone were over 315,000 boxes last month. The April movement promises to be even heavier and that of May nearly as large. Quotations for large lots on the spot are as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$5.25; J. B. grade, do., \$5.35; Bessemer do., \$5.25 @ \$5.30; Siemens Steel, \$5.50. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.75; Siemens Steel, IC basis, \$5.85 @ \$6; IX basis, \$6.85 @ \$7. IC Charcoals—Melyn grade, \$6.25; for each additional X add \$1.50; Alloway grade, \$5.85 @ \$5.95; Grange grade, \$6.10; for each additional X add \$1. Charcoal Ternes—Worcester, 14 x 20, \$5.62½; 20 x 28, \$11; M. F., 14 x 20, \$7.50; do., 20 x 28, \$15; Dean, 14 x 30, \$5.15; do., 20 x 28, \$10.30; D. R. D. grade, 14 x 20, \$4.90; do., 20 x 28, \$9.90; Mansel, 14 x 20, \$5.05; do., 20 x 28, \$10.10; Alyn, 14 x 20, \$5.10; do., 20 x 28, \$10.20; Dyffryn, 14 x 20, scarce, do., 20 x 28, \$10.62½. Wasters—S. T. P. grade, 14 x 20, \$4.85; do., 20 x 28, \$9.62½; Abercane grade, 14 x 20, \$4.85; do., 20 x 28, \$9.50.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, April 8, 1891.

In the Iron market there has been little change the past week. Speculation is still hesitant and purchases for consumption and export are unimportant. Scotch Warrants sold at as low as 42/2, Cleveland down to 37/9 and Hematites to 46/10½. There has been practically no support from new buying orders, despite the fact that stocks in store have further decreased and that warrants are rather scarce. The dullness in Finished Iron seems to have a depressing influence upon speculation. The largest holders are not selling, however, and express the belief that the turning point in the market is near at hand. Consumers are buying only as immediate wants necessitate. There has been a further increase in the number of Scotch furnaces working, and 47 are now in blast. The latest sales of warrants were at 42/6 for Scotch, 37/9 for Cleveland and 47/1 for Hematite.

The Block Tin market has been very steady throughout the week, prices varying but little from £90. 10/ for prompts. The visible supply increased last month about 1000 tons. Deliveries were heavy, but insufficient to offset the heavy shipments from the Straits, and sellers of futures have covered without difficulty. The future of the market seems to depend in good measure upon the outcome of the speculation in New York. Consumption here is still very heavy.

Copper prices have been irregular, yet without really important movement. The statistical exhibit on the 1st of the month was somewhat disappointing, and along with Chili sales, caused a reaction. Stocks fell off 1768 tons during the month, deliveries having been heavy despite the ap-

parent dullness of trade. Sales of furnace material have been moderate, but offers of 9/6 per unit were refused for a large quantity of American Matte for future shipment. The stock of Anaconda Matte here at the present time is about 8000 tons.

In Tin Plate there has been more business doing at late minimum prices. The demand was chiefly Continent and Canada account, but more inquiry from the States is claimed, chiefly for delivery after June. The offers, however, were low. The new works of the Cardonnel Company, at Swansea, have been started up.

Old Iron has been in better demand, but buyers' offers were very low and actual sales unimportant.

Scotch Pig Iron.—The demand for makers' brands is without improvement and prices are without important change.

No. 1 Coltness, f.o.b. Glasgow 65/
No. 1 Summerlee, " " 61/
No. 1 Gartsherrie, " " 60/6
No. 1 Langloan, " " 49/
No. 1 Carnroe, " " 49/
No. 1 Shotts, " at Leith 63/
No. 1 Gengarnock, " Ardrossan 56/
No. 1 Dalmellington, " " 56/
No. 1 Eglinton, " " 50/6
Steamer freights, Glasgow to New York,
2/ Liverpool to New York 10/.

Cleveland Pig.—No improvement in the demand, although makers are now offering at 38/ for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—Lower prices are named, but purchases are light and the demand is tame. Makers quote 50/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—The movement is slow and prices are in buyers' favor. English 20% offered at 95/, f.o.b. shipping port.

Steel Rails.—Makers offer freely and at some concession, but orders come in slowly. Heavy sections quoted £4. 10/ and light sections £5 @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—The market is very slow and prices still tend in buyers' favor. Sellers offer at £4. 7/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The market is slow and prices are still in buyers' favor. Bessemer, 2½ x 2½ inches, quoted at £4. 7/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—Demand is very slow and the market weak. Bessemer quoted at £4. 7/6, f.o.b. at N. W. England shipping point.

Old Iron Rails.—Fair inquiry, but buyers and sellers apart. Tees quoted at £3 @ £3. 2/6 and Double Heads £3. 2/6 @ £3. 5/, f.o.b.

Scrap Iron.—Small sales making at about former prices. Heavy Wrought quoted at £2. 5/ @ £2.7/6, f.o.b.

Crop Ends.—No change whatever. Demand very slow. Bessemer quoted at £2. 17/6 @ £3, f.o.b.

Tin Plate.—Very fair demand, but buyers' offers too low for business of any magnitude. We quote, f.o.b. Liverpool:

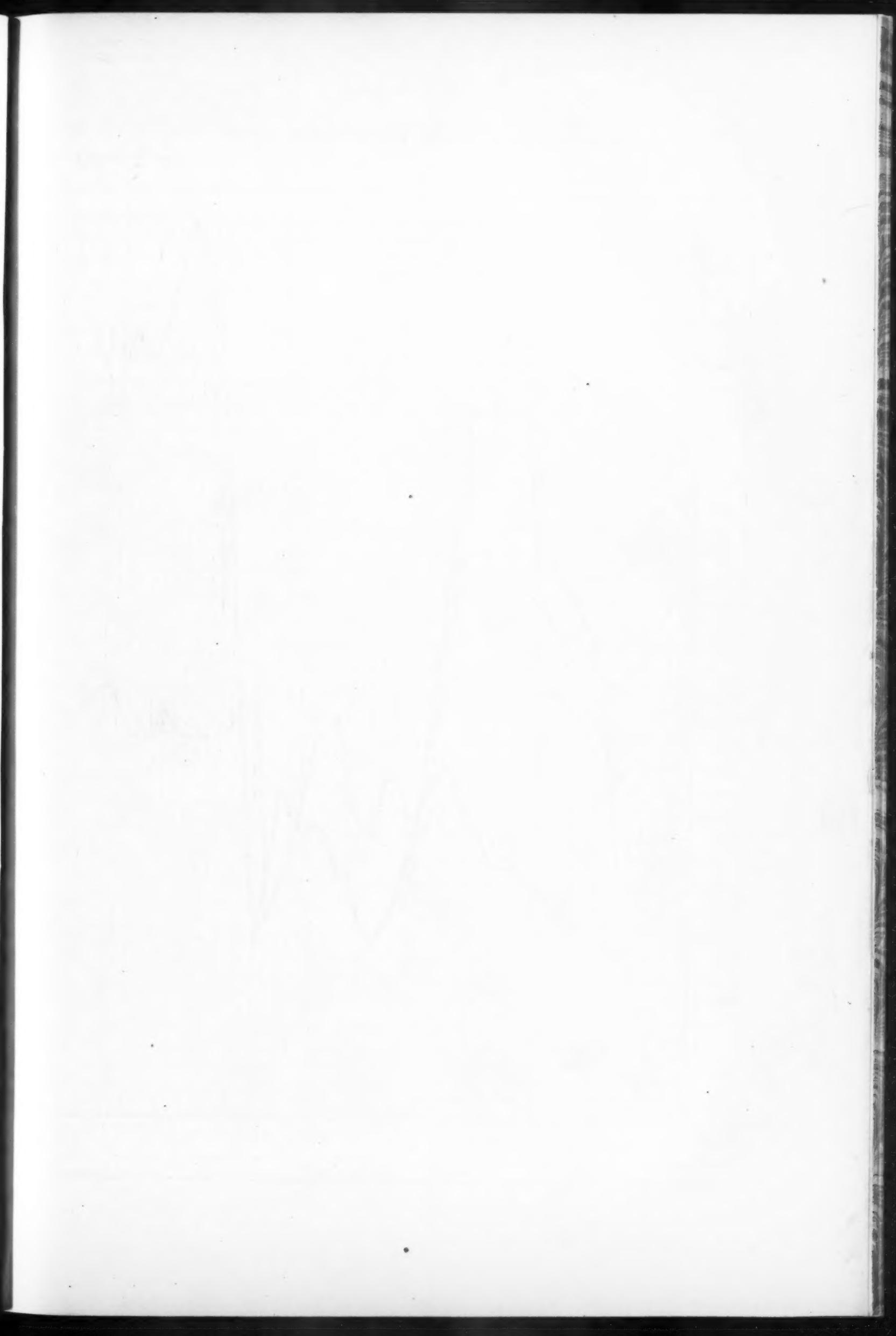
IC Charcoal, Alloway grade 18/9 @ 19/
IC Bessemer Steel, Coke finish 17/6 @ 17/9
IC Siemens " " 17/9 @ 18/3
IC Coke, B. V. grade 17/3 @ 17/6
Charcoal Terne, Dean grade 17/ " .

Manufactured Iron.—Business slow throughout and prices barely steady. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.	
Staff. Marked Bars	8	10	0
Common "	8	6	3
Staff. Bl'k Sheet, singles	8	6	17
Welsh Bars (f.o.b. Wales)	5	17	6
	8	6	2

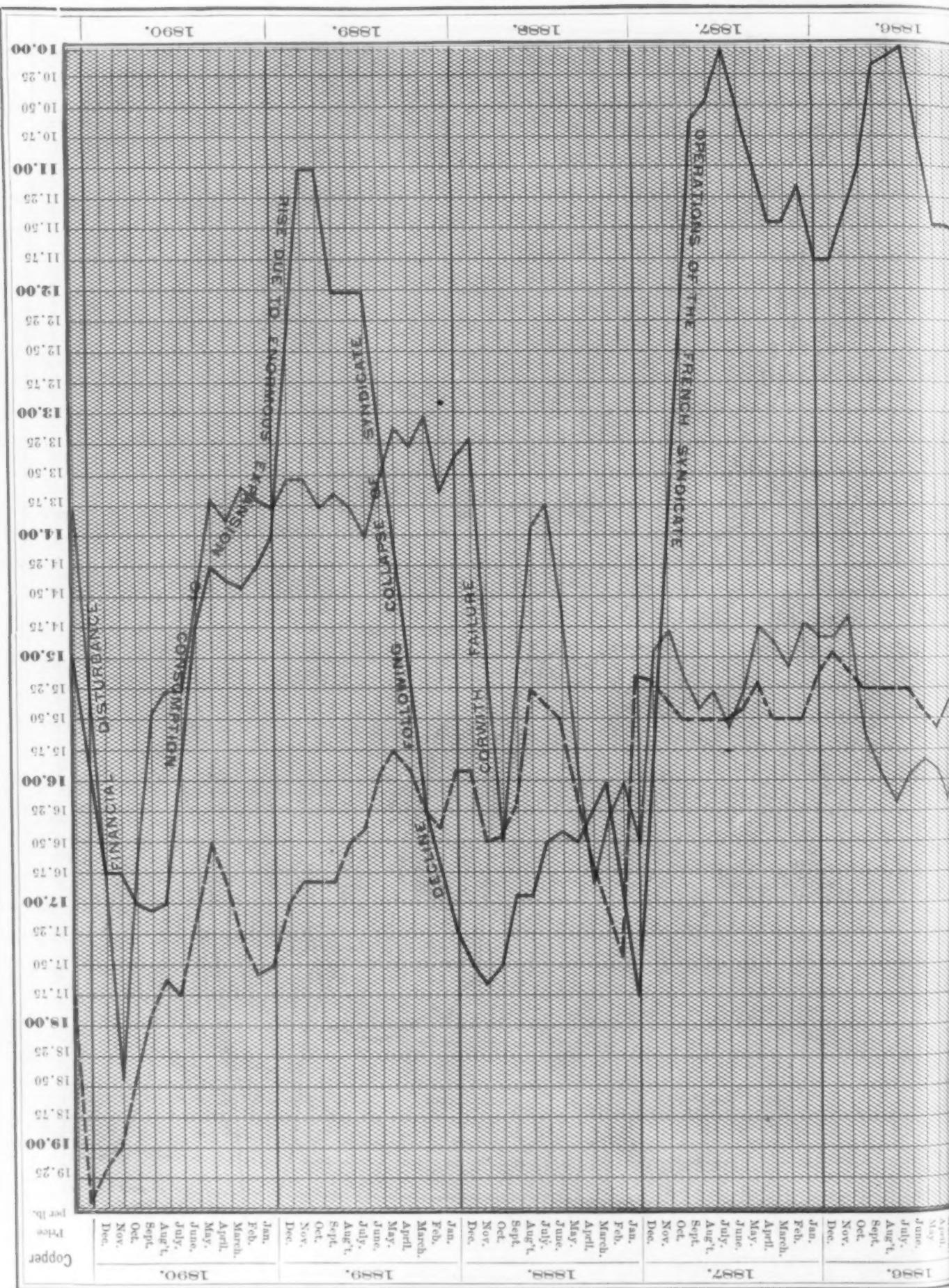
Tin.—The market closes firm, but quiet, with Straits quoted at £90. 15/ @ £90. 17/6, spot, and £91. 2/6 for three months' futures.

Copper.—Improvement in the demand gives the market better tone at the close. Merchant Bars quoted at £52. 12/6, spot, and £52. 17/6, three months' futures. Best Selected, £57. 10/ @ £58.

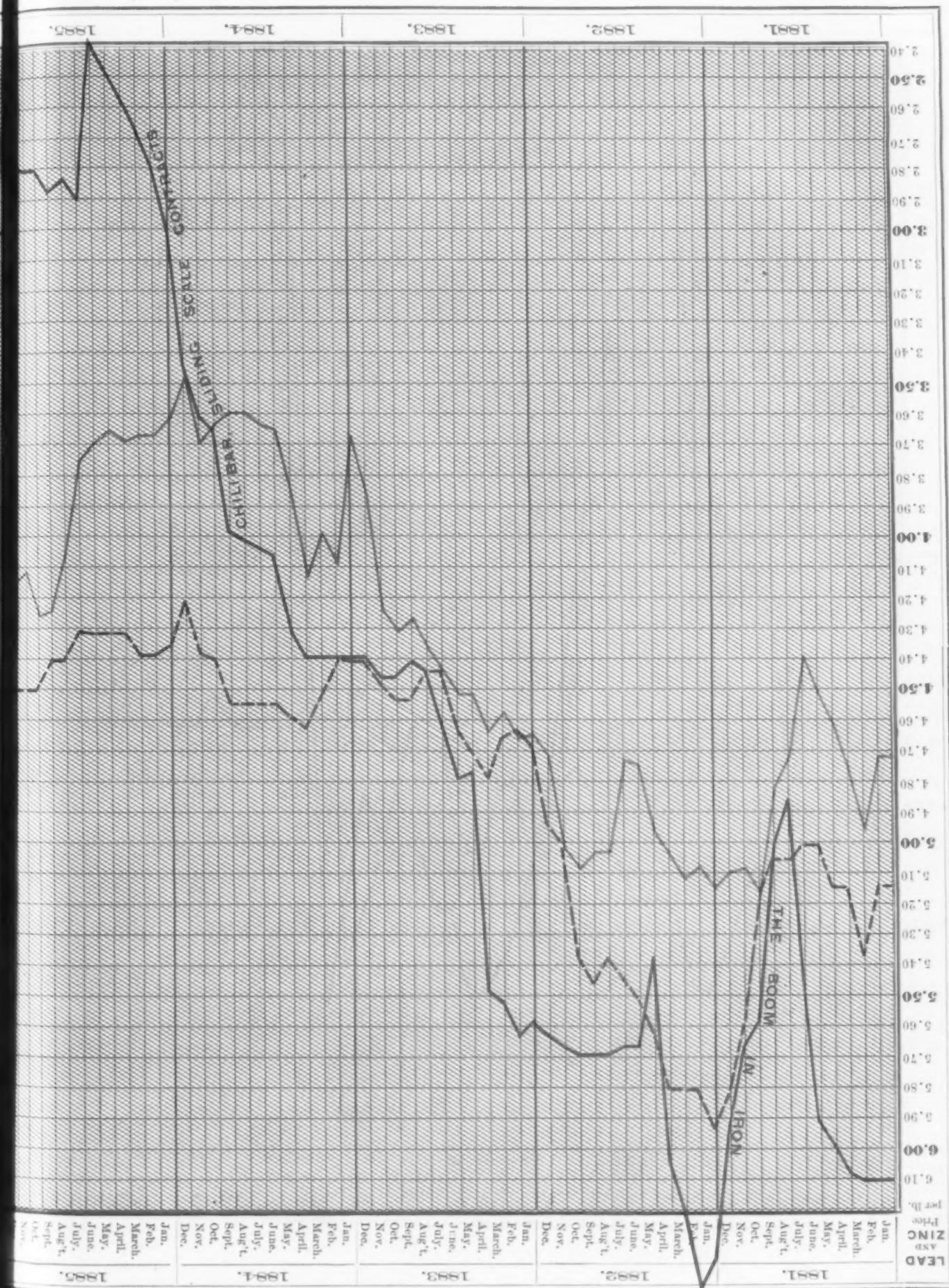


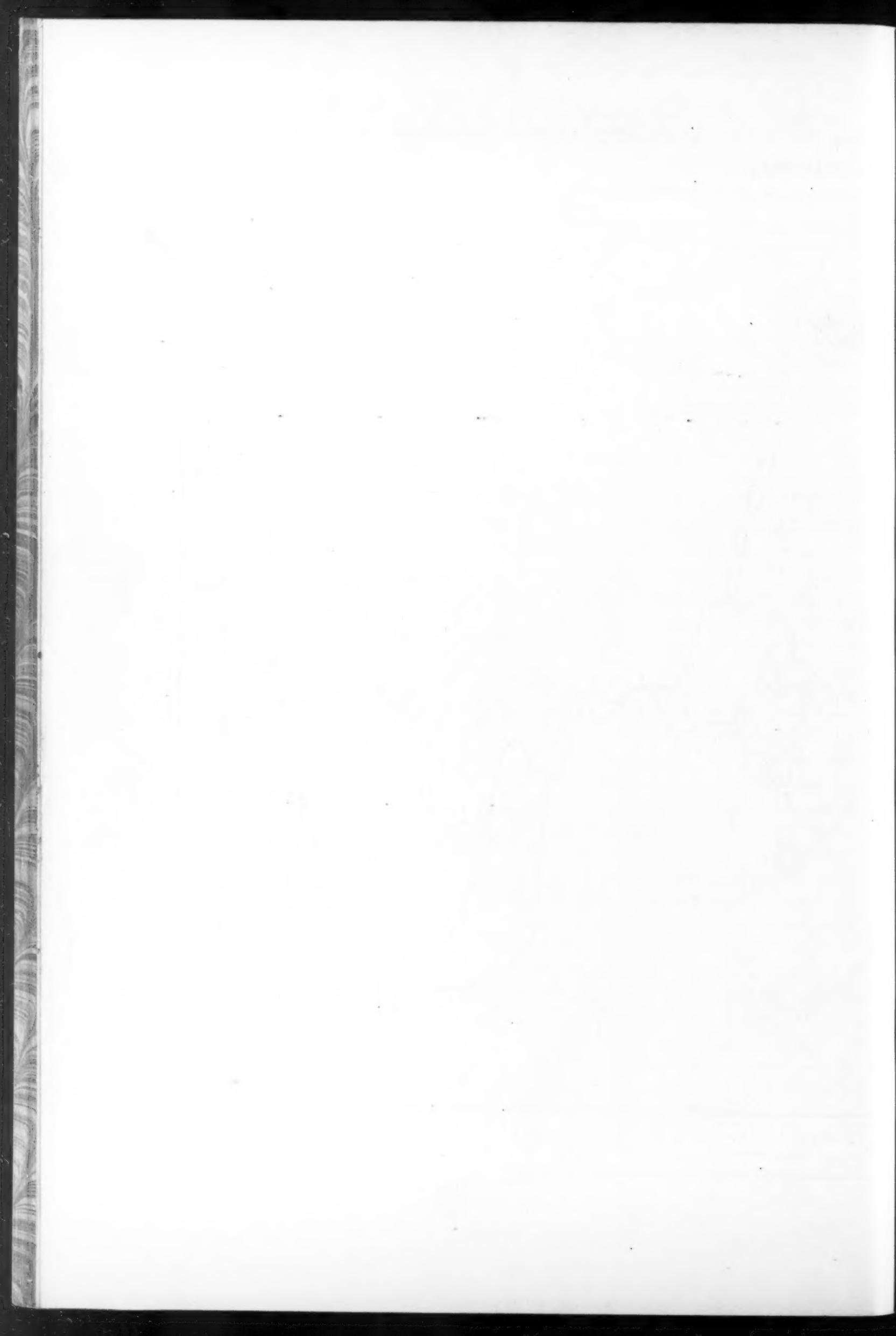
LEAD (full blue line), AND COMMON SPELLER (dotted red line).

THE PRICES OF



LAKE SUPERIOR INGOT COPPER (FULL RED LINE), REFINED FLUCTUATIONS





HARDWARE.

Condition of Trade.

THERE IS SOME complaint made in regard to the volume of business, but in other directions there are indications of increased activity. Trade in the vicinity of New York is reported in fair volume and from travelers in some sections very satisfactory orders are being received, although in most cases they cover assorted lines in moderate quantities, and are characterized by the absence of a speculative element. There is apparently a feeling that prices are not especially strong, and buyers are therefore limiting their purchases to their early requirements. Seasonable goods are moving quite freely, but the demand for staples is not quite so good. There is not much complaint in regard to collections except in some sections where special causes interfere with prompt payments.

The reports given below from Chicago and St. Louis, as well as in other parts of the paper from leading trade centers, will give our readers a correct impression of the conditions prevailing in the country at large, and the review of the condition of trade in the Northwest given in the following columns describes in some detail the conditions of that important section.

St. Louis.

(By Telegraph.)

Jobbers of Hardware report a slightly improved trade since our last report. Orders are not running in staple lines, but call for general assortments. Salesmen are sending in good round orders, and report the outlook very encouraging for a large spring trade. The weather, which was unusually wretched during the entire month of March, has become settled, and an increased trade is resulting therefrom, the country districts sending in a large part of the business. Shelf goods are moving freely, and the usual demand for seasonable goods is reported. Wire Nails and Cut Nails are weak. Barb Wire is in good demand at unchanged prices. Cutlery is active, as are also Garden Tools and Implements. Cast Butts are weak, and prices are shaded somewhat. Some complaints are heard regarding collections, but on the whole they are, generally speaking, fairly satisfactory.

Chicago.

(By Telegraph.)

Very little improvement can be noted in Shelf Hardware, and jobbers say there will not be until the country roads are in a better condition. Two days of sunshine now give promise of more settled weather. Some loss of trade is expected this spring,

however, because the season is so late now that as soon as the fields dry off the farmers must make preparations for seeding and will have no time for building fences and making other improvements. Yet that will make trade all the better a little later. There is a fair demand for sorting up, principally in shelf goods. Copper goods are stiffening with the improved feeling in crude Copper. Slow collections are having their effect on Hardware houses further West, one quite important failure having been announced this week. The Heavy Hardware trade holds up exceedingly well. Iron and Steel are moving quite actively, as well as Wagon Wood Stock, and the demand for Tools, Wagon Trimmings and General Furnishings is more than fair. Orders are being received from all over the Northwest and from parts of Canada. A few slight concessions are being made, but no general reduction in prices has taken place.

Notes on Prices.

Cut Nails.—Since our last review the movement of transactions has been moderate and the market remains without important change. The mills are in most cases pursuing a conservative policy and not endeavoring to force sales, and the general quotation remains as before on a basis of \$1.60 for carloads at mill for the most approved brands, a figure which is sometimes shaded. Quotations for small lots from store in New York are on a basis of \$1.75 for Iron and \$1.85 for Steel, with the usual concessions in large lots.

Chicago, by Telegraph.—A little better demand is reported for factory lots, and a heavy trade is expected as soon as the weather has settled. Stocks are so light in second hands that the manufacturers must at once feel any improvement in the consumption of Nails. A favorable indication of better business is the inquiry from sections in which the Wire Nail was supposed to have completely superseded the Cut Nail. Prices from factory are about \$1.75, Chicago, for usual specifications, but some shading is reported. Jobbers continue to quote \$1.85, with 5 cents off for carloads.

Wire Nails.—During the past week the market has not improved in tone, but remains in substantially the same condition as at our last review. The volume of business has been only moderate, but it is understood that some sales of considerable quantities have been made. Quotations are on a basis of \$2.10, f.o.b. at mill, for carload lots, but this figure is shaded on specially desirable orders. Small lots from store are held at \$2.30 to \$2.35, with 5 cents off for carloads.

Chicago, by Telegraph.—Manufacturers' agents report better inquiry and a larger trade the past week, but the aggregate volume of business is by no means what it should be. Low prices are current, but

the usual rate to carload buyers is \$2.20, Chicago, from factory. Jobbers continue to quote \$2.30 from stock, with concessions to best buyers.

Barb Wire.—The market on the whole seems to be in a very satisfactory condition and fair business is doing. Reports are, however, conflicting in regard to the demand, some manufacturers reporting it exceptionally good and others referring to it as only moderate. Prices in general are well maintained, but it is reported that concessions have been made in some exceptional instances. Prices are on the basis of \$3.50 for Four-Point Galvanized and \$2.95 for Painted, with the regular abatement of 10 cents for carload lots and 5 cents for jobbers and railroads; terms 60 days, or 2 per cent. discount for cash in ten days, with delivery at leading points.

Chicago, by Telegraph.—Nothing new to report. Jobbers are doing but little and prices are unchanged.

Horseshoes.—Rhode Island Horse Shoe Company, Providence, R. I., for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, announce under date April 2 that they are prepared to receive orders for their new Perkins Toe Weight Shoe in light, medium and heavy patterns at 5½ cents per pound, subject to the same discount and terms as their regular patterns. This Shoe is illustrated in a special circular which they issue, calling attention to its new features and emphasizing especially the fact that the weight of material is at the toe, the width of the web following the formation of the shell of the hoof, being wide at toe and narrow at heel.

Glass.—There are no signs of improvement in the Glass trade, but on the other hand there are indications of decreased activity. The factories which are in blast are supposed to be at work largely upon orders which were accepted at extremely low prices. The nominal price for American Glass, in small quantities, is stated to be 80 and 10 per cent. discount on Single, but it is understood concessions are made from these figures in many cases. Reports from St. Louis of a Glass combine being formed and of an advance in the price of Glass resulting from it lack confirmation.

Wrought-Iron Pipe.—For some time the demand for Wrought-Iron Pipe has been light and the market has not been in an entirely satisfactory condition. A meeting of the associated manufacturers was held last week in Pittsburgh and it was found necessary to reduce quotations to the figures named below. It will be seen that the reduction is an important one:

	Discount.
1½ inch and under, plain.....	57½ %
1½ inch and under, galvanized.....	50 %
1½ inch and over, plain.....	67½ %
1½ inch and over, galvanized.....	55 %

Boiler Tubes.

2½ inch and smaller.....	55 %
Larger than 2½ inch.....	60 %

Scales.—The following are the discounts made by Osgood & Thompson, Binghamton, N. Y., on the line of Scales, &c., of which they are manufacturers:

Portable Scales.....30 %

Wagon Scales.

3-ton—7 x 13 foot platform.....30 %

3-ton—8 x 14 foot platform.....35 %

4, 5 and 6 ton.....40 %

Over 6 tons.....45 %

Railroad Depot Scales.....30 %

Miners' and Transportation Scales.....30 %

Portable Bullock Scales.....40 %

Railroad Track Scales.....40 %

Sundries.

Wagon Scales, with double beams:

3 to 5 tons, extra net.....\$3

6 tons and over, extra net.....5

Triple beams, requiring no loose weights, extra net.....15

Beams, graduated both sides, extra net.....3

Weigh books, with perforated stubs, 100 blanks each, per dozen.....2

50-pound U. S. Standard Test Weights.....3

Beam Boxes, extra net.....5

Iron Pillars and Cap, for offices.....15

Hog Ringers.—We are advised by Heesen Bros. & Co., Tecumseh, Mich., that the price of the new style Wolverine Hog Ringer has been reduced from \$4 to \$2.25 per dozen. Some of the parties handling these goods are, we understand, still holding them at the old figure.

Hack-Saw Blades.—S. A. Smith, 23 South Canal street, Chicago, is putting on the market a Hack-Saw Blade designated as the Superior, which is sold from the following list, which is subject to a discount of 30 per cent.:

Length of blade, 6, 7, 8, 9, 10, 11 and 12
Price per dozen, \$0.65, .70, .75, .80, .90, .95 and 1.00

This line of Hack-Saw Blades is referred to as having recently been put on the market, and special claims are made for its quality. These goods are described as being specially tempered, having very fine teeth, and the fact is emphasized that the teeth are made after the Saw is tempered in such form as to give ample clearance. The quality of the material is also specially referred to.

Trade in the Northwest.

FROM ADVICES received from a large number of Hardware merchants, wholesale and retail, in the Northwest, we are enabled to give the following comprehensive review of the business situation in that important section. Our information relates to the condition of business in general, and especially the condition of the Hardware business; whether or not stocks of Hardware are large or small; the general tone of the market as to prices; prospects for trade during the season; prospects for building; agricultural conditions, as affecting trade; condition of the money market, as shown in collections, and other points having bearing on business and the outlook for the next few months. Our advices on these points are full and satisfactory, and from them we are enabled to make the following condensed description of the situation.

It is obvious that these advices from merchants of standing in the principal cities and in the smaller towns furnish material of exceptional value for such a review, which thus coming from many in-

dependent and unbiased sources, may be accepted with confidence as comprehensive and accurate. It will doubtless be of interest to all who desire advices in regard to these important markets. We desire to express our appreciation of the careful attention given by our correspondents, to whom we are indebted for this information which is thus put at the disposal of the trade.

North Dakota.

The general condition of business in North Dakota is somewhat better than for the past two or three years. Some parts of the State, however, by reason of failure of crops for three seasons, are not in so good a condition. The Hardware trade is reported as being in a healthful condition, although stocks are not heavy. Prices are generally well maintained. Prospects for the next three months are dependent entirely upon the crops. In the western part of North Dakota stock raising has become the principal industry, and the outlook for trade in this section is very encouraging. The indications are that building will be carried on to a considerable extent. From Fargo it is reported that throughout the Red River Valley generally crops were good last season, and all present weather prognostications indicate another prosperous season, and farmers are very sanguine. The soil is in a better condition for a crop than it has been for the last three years at this season, owing to the abundant snowfall, which will leave the ground in good condition to receive grain, which will quickly sprout, and a sufficient rainfall from that time until harvest will insure a large crop. Collections in this section of the State have been good. From 50 to 95 per cent. of outstanding debts were collected up to January 1, 1891. Traveling men are hopeful for the future, having had a good trade from all sections of North Dakota, except the southwestern portion of the State. The majority of the farmers are going into stock-raising, so that in the near future they will not be dependent upon crops alone, which, it is thought, will make the country more prosperous. From Dickinson it is reported that inexhaustible beds of Coal are being opened up. Brick and Pottery works are being built, and other industries are to be established there this season. Much encouragement is derived from the fact that farmers are diversifying their crops and will not in the future be entirely dependent upon Wheat for their income.

South Dakota.

Business in general is improving as spring approaches. A large part of the population are newcomers and dependent upon what the farms produce, and, as last summer was very dry, almost equal to a drought in some locations, very little was raised; consequently, trade and business have been dull. Chattel mortgages cover a large portion of the farmers' personal property, and they have been purchasing only necessities of life. It is stated that very few Hardware concerns are paying more than expenses at the present time,

but that the stocks are up to the average in anticipation of a large spring trade. Prices on Hardware are well maintained, with indications of advances. As the situation is entirely dependent upon the crops for trade, they do not look for a large increase in business until August. In some localities the prospect for building is fair, although generally throughout the State it is not flattering. Sheep and cattle are being sent to West South Dakota to graze on buffalo grass, which grows the year round, and the stock business is thus assuming large proportions. One of our correspondents thus tersely explains the situation: "No crops for two years. No crops, no trade, see?"

Collections have been fairly good for 1890 and 1891, though in some sections of the State extensions have been asked and renewal of note has been quite common. Reports from traveling salesmen are conflicting, depending largely upon the territory which they are covering. Alliance movements and legislation have a tendency to withdraw money loans and capital. Some machinery manufacturers refuse to make sales except for cash orders. From the section of the country tributary to Aberdeen it is reported that the outlook for the future is bright. Dakota people are referred to as full of energy and hope. The late snow will be of incalculable benefit to them. This, with the spring rains, will make the ground more moist than it has been for several years. Irrigation by artesian wells is being agitated a great deal, and farmers are putting down these wells for that purpose, with a view to insuring a crop every year, and the old enemy, drought, will have to leave this State in the near future. From some points a bad condition of collections is reported, and we are advised that not only the Hardware, but all other business is being brought to a cash basis. If any one desires a line of credit, he is required to give a chattel mortgage, with ample security for the probable amount wanted. When the amount secured is used up, the credit stops until further security is given. This result has been brought about without much friction, and is highly satisfactory to the business men at least.

Oregon.

Reports from Oregon indicate an encouraging state of affairs throughout the larger portion of the State. Emigrants are obliged to buy stoves, furniture and agricultural implements, which makes business in these departments particularly good. The Hardware trade appears to be in a healthy condition, although there is a large demand for credit. The stocks have been well kept up and are usually full in anticipation of the spring trade. It is reported that there has been a stiffening in the price of Barb Wire, in sympathy with the Eastern and San Francisco markets. Nails have declined, following the recent decline in Portland. Prices on the average, however, are satisfactory and have been advanced generally with the advance in freight rates. Prospects for the next few months are good and it is expected that

April trade will show a decided improvement. There seems to be a general movement throughout the State toward improving resident property, and a large number of new residences will be erected during the coming year. Besides the crops, the dairy business and stock raising are largely engaged in. There being an abundance of grass, it is expected that money will soon move from these two resources. Fruit raising is largely carried on in some sections and there are indications of a large crop, as is also the case with wheat. The acreage is large and the amount of snow which fell there the latter part of the winter has added much to the expectation of a good wheat crop. Collections in the section of the State in which hops are raised have been very good. There are, however, complaints from other sections that collections are slow, as they usually are at this season of the year. Merchants are becoming more conservative in regard to giving credit, and consequently are not buying as liberally as usual. In the neighborhood of Empire City there was a large amount of capital invested last season in coal mining, shipbuilding and lumbering; the outlook for the coming summer is very encouraging.

Wyoming.

The unsettled weather has resulted in business being rather quiet, January and February not being up to the usual average. Stocks, however, are quite full and there is a desire to sustain prices. A correspondent from Cheyenne states that stocks of goods in this part of the West are necessarily large, from the fact that they are so far from the manufacturing center, and this compels dealers to carry larger stocks than Eastern merchants. The high rate of freight is another factor which necessitates Western merchants carrying heavy stocks. Prospects for the coming season are quite satisfactory. Building has commenced, and it is expected to keep up all the summer. Houses are being rented before they are finished, and rents are stated to be very high. The prices cattle are bringing are not satisfactory, but the prospect for farming is better than it has been for four years on account of the heavy falls of snow. Collections are up to the average of last year. Traveling men report that the dullness in business is but temporary, and are hopeful for the future. There is considerable dissatisfaction expressed at the passage of the new land law by the late Congress, which is said to be ruinous to all new or unsettled parts of the country.

Washington.

Indications from Washington are that while business is comparatively light at present the outlook for the future is encouraging. A large demand for Builders' Hardware is expected, and while stocks are large in the larger towns they are somewhat below the average in smaller places. There is, however, indication that goods will be bought liberally for spring consumption. Prices are well

kept up in most cases, but reports from the larger centers indicate that prices on Butts, cheap Locks, Nails, &c., are cut quite generally, and that staples are sold on small margins. The prospect for the future is bright and quite liberal investments of capital from the East are expected to help the situation. A large number of public and private buildings are going up in different parts of the State. Improvements on farms will depend upon the outcome of the crops. Banks and loan corporations are not loaning money as freely to farmers on live stock and growing stock as could be desired, but it is hoped that with more favorable indications for the future money will be more easily obtained. A correspondent from Whatcon says that collections have been pretty good, and that they have collected 75 per cent. of what they had standing out the first of the year. Business for the coming season is to be cash as near as possible, and they are expecting a good trade. The agricultural trade with them is mostly cash, and is referred to as being no small item. Reports from traveling men are encouraging for a good spring trade.

A Port Townsend correspondent reports that they are expecting to have built at that point during the coming season a U. S. custom house, costing \$250,000; a county court house, \$200,000; a county school house, \$60,000; and a City Hall, \$30,000.

From a prominent firm at Spokane Falls we have received the following comprehensive review of the business situation:

Business in general is good for this season of the year, the demand for Hardware being very good and increasing daily. Trade for the past two weeks has shown unusual activity, the jobbing trade being especially good. Stocks of Hardware in the country are relatively small. A great many small stores and camps off the line of railroads, are dependent on good roads, and as soon as the mud goes, there will be a large trade from this source. Prices average fairly good, but there is some disposition to cut on staples in order to make sales. The prospect for 1891 is very bright. The mines will be very active, and have planned to work to their full output. The immigration is now good and from all reports is to be larger than any previous year. They all "outfit" after reaching here. The winter has been a favorable one for stockmen and also for the farmers. There is plenty of snow in the mountains to insure the full amount of water in all the streams, which is favorable to the loggers and miners. The Great Northern Railroad will do a large amount of work near here, and the cable road of this city will put in 15 miles of cable road this summer. There are several new business blocks planned to be built this year, but the building will fall far short of last year in this city, as most all of the buildings were built to replace those destroyed in the fire. There will be a good many residences built, as this was neglected last year. It was impossible to get men or material enough to build them. Everything was neglected to get the blocks finished before winter. Collections have been only fair, but are improving, and our travelers report a general good feeling and anticipation of good trade from all sections we have visited.

Utah.

Trade is generally in fair condition, though perhaps not quite as brisk as it was at this time last year. Advanced freight rates have caused a slight advance on staple goods, and while stocks are not very full at the present time it is expected that merchants will order more freely later. The large number of jobbing houses represented has caused prices to be cut in many cases, but the outlook for the future is encouraging, especially in the line of building. The past winter has been a very favorable one for farmers and they anticipate large crops for this season. Collections are somewhat slow, but are said to be improving. Unfavorable weather has made trade quite backward, but as soon as there is an improvement in the roads they expect a corresponding improvement in trade. We learn from Ogden that large iron works are likely to be built there during the coming season, which will be of benefit to that section of the country.

Montana.

Business is reported as in a healthy condition, notwithstanding the heavy snowfall and severe weather with which the winter closed. It shows signs of improvement, owing to warmer weather. The outlook for the Hardware business is bright, and a good summer and fall trade is expected. Stocks are large, especially in cities to which the mining industry is tributary, and are well assorted. Prices are said to be firm, consequent upon a generally healthy tone of all lines of industry throughout the State. Prospects for the future are good, and quite an increase in trade is confidently looked for. The State is settling up rapidly, and building will consequently be good, as the towns are growing fast. The snows of February and March make the prospect for crops good. Collections are reported to be somewhat slow. There is a general hopeful feeling expressed by the traveling men in almost all parts of the State.

Idaho.

It is reported that the disposal of the silver question has resulted disadvantageously to Idaho as a silver-producing State. Mining-Hardware trade is very limited as mine owners, small and large alike, see little inducement for them to venture their capital. The Union Pacific Railroad Company advanced freight rates on ores 20 per cent. per ton for transportation to the reduction works. Prices are reported as being low, but indications point toward higher prices in the near future. In the agricultural district prospect for trade is quite flattering. They have had plenty of snow on the high lands, and unless there should be a hot and dry spring, the farmers will be assured good crops, which will result in a good business. Collections are reported as not being up to the average, but trade throughout the State seems to be as good as could be expected at this time of the year.

Reports from the southern part of the State, which is a farming and stock dis-

trict, are not encouraging, resulting from the low prices which are being paid for wheat and live stock. These effect trade unfavorably, although there are indications of improvement in all lines when spring opens.

Trade Items.

THE DIAMOND DRILL AND TOOL CO., of Akron, Ohio, a new corporation, have issued a handsome 32-page catalogue of their specialties, comprising Drills for boring brass and soft metals, Pipe Taps, Increase Twist Drills, Steel Sockets, Machine Bits, Countersinks, Counterbores, Ratchets, Drills to suit special drill presses, Flute Drills, Reamers of all kinds, wood boring Brace Drills, Milling Cutters, Screw Driver Bits, Stay Bolt Taps, Adjustable Dies, &c. An interesting and valuable table shows the different sizes of Drills to be used when a full thread is to be tapped in a hole. Another table shows the revolutions per minute for Drills from $\frac{1}{8}$ inch to 2 inches, as usually applied, for steel, iron or brass. The company state that all their tools are made from the best stock, with improved machinery and by skilled mechanics of long experience in manufacturing Drills. They are also prepared to manufacture special tools. Temporary quarters are now occupied by the company, but new works will soon be erected. Plans have been made and construction will be pushed so that the buildings can be occupied in July.

NUBIAN IRON ENAMEL COMPANY, Chicago, send to any address, calendar leaves for April and May, mounted on an inclined stand. Each leaf contains an advertisement of Nubian Iron Enamel.

IT IS REPORTED that a new combination or consolidation of Wringer manufacturing companies is contemplated, with the main factory and offices at Chicago and branch factory at Pittsburgh. It is understood that Chicago and Boston capitalists are interested in the matter. A meeting of the stockholders of the Erie Wringer Mfg. Company, Pittsburgh, has been called to consider the matter. It is stated that a free plant has been offered in the vicinity of Chicago. The capital stock of the new company is said to be \$200,000.

IT IS ANNOUNCED by the Eastman & Krauss Razor Company, 98 Chambers street, New York, with factory at Stapleton, Staten Island, that they have organized a stock company for the purpose of manufacturing Razors of all kinds of a superior quality and design, as well as Razor Strops and Pocket Cutlery of all kinds. The officers of the company are as follows: D. Eastman, president; A. Krauss, vice-president; H. E. Stone, secretary, and W. Hurst, treasurer. The company state that the blades of their Cutlery are American hand-forged and that men of many years' experience are at the head of each department of their business. It is also stated that they are the sole owners and manufacturers of the Home Safety Razors, the excellence of which is referred to.

IN THEIR ADVERTISEMENT on another page Dame, Stoddard & Kendall, 374 Washington street, Boston, call attention to the interesting line of Kuives and other steel implements made by R. Murphy, for whom they are selling agents.

THE ANNOUNCEMENT is made that the Cincinnati Lead Pipe and Sheet Lead Works, having greatly enlarged their factory, will operate in connection with their present business a brass foundry. They have added an extensive line of new and improved machinery for the manufacture

of staple and special Brass Goods. This department will be known as the Standard Brass Works.

WE ARE ADVISED by J. H. Hoague, Chicopee, Mass., that he has been so busy fitting up his new works, formerly occupied by the Gaylord Company, that he has been compelled to postpone the publication of his new catalogue. It will, however, be issued before long.

THE MORSE EQUALIZING SPRING COMPANY, Trumansburg, N. Y., have changed their firm name to the Morse Spring Company. The company are now making a specialty of furnishing Springs, &c., for their Morse Cart.

ROBERT N. DIAZ COMPANY, 69 Pearl Street, Boston, advise us that they have recently purchased a large lot of Dog Collars at a special price and are now prepared to offer them at exceptionally low figures. They indicate their willingness to send the goods on approval to those who cannot inspect their stock. They refer to their new quarters as enabling them to display the goods to advantage.

GEORGE E. SACKETT has retired from the firm of Crane Bros. & Co., Yazoo City, Miss., and his interest has been purchased by the other members. Mr. Sackett has been interested in the firm since its formation, and withdraws from it to become general manager of the New Albany Forge Works. The style of the firm will remain unchanged.

W. H. GRIFFITH, who was for many years associated with the Wiebusch & Hilger Hardware Company, and of late years has been traveling West for the Meriden Cutlery Company, resigned his position with them January 1, and has recently accepted a position with the Bridgeport Chain Company to take charge of their sales department. His headquarters will be at Bridgeport, Conn., where he may be addressed care of Bridgeport Chain Company.

IT IS ANNOUNCED that the business heretofore conducted under the name of Samuel C. Tatum & Co., Cincinnati, Ohio, has been incorporated under the laws of that State as the Samuel C. Tatum Company. No change is made in the management of the business, and the officers of the new company are as follows, S. E. Hilles, president; W. S. Mendenhall, vice-president, and W. O. Burgess, secretary.

GRAY, FALL & Co., Nashville, Tenn., wholesale Hardware dealers, issue a want and order book for the benefit of their customers. This is 6 x $9\frac{1}{2}$ inches in size, bound in paper covers, and contains over a hundred pages. The first 16 pages are devoted to conveniently arranged standard lists. The next 32 pages are blank, for keeping a record of goods to be purchased. The last 64 pages are the order blanks of Gray, Fall & Co., arranged for name, post office, State and shipping point. They are ruled with headings for quantity, description of article, number or size and price. The order blanks are perforated along the inside edge, for tearing out. The book will doubtless be appreciated by their customers.

"How to Hoist with Wire-Rope Blocks" is the title of an attractively printed pamphlet of Walter Coleman & Sons, Edward J. F. Coleman, proprietor, Providence, R. I. Illustrations and descriptions are given of Crescent Brand Steel Tackle Blocks, with plain and self-lubricating sheaves for wire rope. They are also dealers in Wire Rope for all purposes, Wire-Rope Clamps, Hooks, Guy Shackles, &c. Graphite Grease for wire rope. After giving reasons why, in their estimation, wire rope for hoisting has been a failure, they state what is required

and what they have produced. Illustrations are given of the Crescent Brand Steel Snatch Blocks in the various forms, with explanations of the way they are strapped, price-lists and such other descriptive matter as is necessary for a full and thorough understanding of these goods. The pamphlet is artistic in its make up, and presents the matter in an interesting form.

S. A. WILDE MFG. COMPANY, Taunton, Mass., advise us that they are making a large line of their Farina Boilers, and offering them at a low price. The cover is made to fit both parts of the Boiler, so that they can be used separately as a sauce pan.

IN THEIR ADVERTISEMENT on another page Kilmer Mfg. Company, Newburg, N. Y., call attention to their Steel Wire Rods, Bale Ties, Barb Wire, Wire Nails, Staples, &c., which they are manufacturing, giving illustrations of some of their leading specialties.

THE HOPKINS & DICKINSON MFG. COMPANY have decided to stay in their old quarters, 83 Reade street, and are fitting up the store handsomely inside and out.

Price-Lists, Circulars, &c.

MERWIN, HULBERT & CO, 26 West Twenty-third street, N. Y.: Bicycle catalogue, with transparent covers, illustrating and describing their large line of Cycles and accessories. Their assortment of Wheels is large, ranging from a cheap grade of boys' Safety, with cone bearings, to the Pneumatic Swift, a high grade machine. This machine weighs 42 pounds, all on, while the Pneumatic Swift Racer weighs but 22 pounds. The machines shown between these extremes of grade and price present an opportunity for choice of make and price seldom found between the covers of any one catalogue. Illustrations are also given of Ideal Tricycle, Gem Iron Velocipedes and Gem Tricycle. Prices are given of ordinary Bicycles, although they state that High Wheels have been rather crowded out owing to the great demand for machines of the Safety type. The catalogue is one that will doubtless be appreciated by the trade.

PULLMAN SASH BALANCE COMPANY, Rochester, N. Y.: Spring Sash Balances for Business Blocks, Car Windows, Private Residences, Show Cases, Refrigerators, &c. It is claimed that these Balances can be used where it is impossible to use weights, in old houses and many other places. The Balances are made for sash weighing from 4 to 100 pounds. A number of representative testimonials are given in their catalogue. The manufacturers advise us that the demand for their goods is increasing so rapidly that they are now preparing to double their capacity next fall. They also state that they have added some improvements, greatly simplifying and strengthening their products.

SANDWICH MFG. COMPANY, Sandwich, Ill.: Sandwich Shellers, both power and hand; Samson Power, O. K. Feed Grinder, Sandwich Barrel Cart, General Utility Cart, Steel Hay Press, Sandwich Chain Geared Mower, &c. The Barrel Cart is referred to as not being limited to the use of a single barrel, as extra sets of Barrel Irons cost but little, and may be attached to any oil barrel. When these irons are placed on barrels, the cart may readily be detached from any one barrel and used to transport another, or the cart may be used with a box, which adds greatly to its range of usefulness.

AMERICAN SCREEN COMPANY, Brookline, Mass., 47 Liberty street, New York: Flexible Steel-Frame Sliding Window Screens. The Screen is placed outside the lower sash, and extends from the window sill to the lower part of the upper sash. It is claimed that the frame being $\frac{3}{4}$ inch thick does not interfere in any way with

the use of outside blinds, and that, working in a metal groove, it is not affected by the weather.

KINGMAN, STURTEVANT & LARRABEE, Binghamton, N. Y.: Star Gear Buggies with Spindle, Concord, Piano or Corning Bodies, and in Oak or Painted, as desired. They build the Tuxedo, Spindle, Spindle Surrey, the Montclair Oak Surrey, the Lenox Oak Cut Under, and many other novelties. Their Star Gear is referred to as being practical, easy riding, durable and not expensive.

THE GOSHEN SWEEPER COMPANY, Grand Rapids, Mich.: The Sweepers shown are the Conqueror, Supreme, Gilt Edge, Acme, Goshen, Advance and Ladies' Friend. The company also manufacture the Neptune Tub Wringer and Goshen Bench Wringer.

PENNSYLVANIA SAW MFG. COMPANY, 601 South Seventeenth street, Philadelphia, Pa.: Catalogue illustrating a line of Hand Saws, Butcher, Compass, Wood Saws, &c. They temper and patent ground Saws, Circular, Band, Mulay, Mill, Ice, Cross-cut, Hand, Panel, Rip, Compass, Butcher, Wood Saws &c., Saw Frames, Saw Sets, Slaw Cutters, Wall Scrapers, Plastering Trowels, Plasterers' Mitre Rods, &c. The company make the point that they are not connected in any way with the Saw combination, and that they have all the improved machinery for making Saws, which enables them to turn out 100 dozen of all kinds of Saws a day.

OVAL CHURN COMPANY, Goshen, Ind.: Oval Churns, Step Ladders, Excelsior Scrub Brush, Screen Doors, Bench Wringers and Adjustable Trestles. These Trestles are for the use of carpenters, plasterers and paper hangers. They can be adjusted to suit height of ceilings or length of rooms.

WRENN, WHITEHURST & CO., Norfolk, Va.: Revolving Disk Fly Fans. They are described as being made of brass and copper, except the disks, well built, heavily nickel plated, handsomely finished and very ornamental. The material, it is stated, is all of the best, and that one winding of the clockwork will run it for about two hours and a half. The manufacturers claim that flies will not ride on these disks, and that the disks, which constantly revolve, will frighten away the flies, and that the rapidly revolving disks not only frighten and drive away the flies, but also cause a pleasant circulation of air.

SOUTH BEND WAGON COMPANY, South Bend, Ind.: Farm, Plantation, Freight and Light Wagons. The manufacturers state that the South Bend Wagon has been on the market ten years, and that only seasoned A grade timber and the best irons, paints and varnishes are used. Also that their patterns are new, machinery the latest improved, labor the best they can obtain, and that their works are confined to the manufacture of Wagons exclusively.

INDIANAPOLIS WAGON COMPANY, Indianapolis, Ind.: Fine Buggies, Surreys, Depot, Park and Spring Wagons; also Patent Short-turning Gears, to which particular attention is directed. In their catalogue especial mention is made of their No. 6 Spring Wagon, which may be used either as a business or pleasure wagon. It is stated that the bodies are hung as low as a family carriage, allowing passengers to get in or out without inconvenience; and also to allow getting articles into and out of the body without trouble. The Short-turning Gears are used on these vehicles.

DAVISON MFG. COMPANY, Davison, Mich.: Portable and Stationary Self-Heating Bathtubs, with Russian Bath Attachments. The water is first poured into a funnel, which has a capacity of 10 quarts, and as it runs through the pipe leading from the funnel into the tank, the water makes a series of circuits amounting to nearly 60 feet, heating, it is stated, instantaneously, then passes through a pipe into the Tub. The manufacturers furnish for heating the water either Gasoline,

Kerosene, Gas or Natural Gas Burners, as desired. The heating arrangements and water tank are contained in the rear portion of the Tub, out of sight.

Louisville.

FROM A CORRESPONDENT in Louisville we have the following advices in regard to the markets and related topics:

The Hardware trade of Louisville, Ky., is about as good as that of any other city, but all are bad enough. Throughout this whole region of the Southwest there has prevailed such unusually bad and depressing weather that no line of trade can thrive unless it might be water proof clothiers and druggists. During the whole of March there were 27 days it either rained or water in some shape was precipitated in this locality. Usually, this season of the year, most of the corn land is turned, but, so far, hardly a furrow is plowed.

The merchants are becoming resigned and will soon develop into sound philosophers, and it is sincerely hoped the manufacturers, realizing the inert state of trade, will not attempt much force work by cutting prices. Values are too low now, and any amount of shading will not create activity, but, to the contrary, cause further depression. Every one looks with confidence toward a few days of sunshine. And yet a fair amount of business is being done, but country orders of unusual size are scrutinized very carefully, dealers preferring those more in keeping with the conservative feeling prevalent.

There is probably a less amount of building projected than usual, especially so in the boom towns of the country. Those sections that possess real advantages do not lack money and confidence to develop them, but many visionary promises are quietly marked doubtful and filed away. There is one important element of all building and improvements that does not get cheaper or accumulate, Lumber. Prime Lumber of all kinds readily commands a good price, and is being enhanced in value each year, as the supply becomes perceptibly shorter. Although there is, contiguous to Louisville, the finest area and quality of timber east of the Mississippi River, yet those directly in the business view with alarm the rapidly decreasing outlook. Quartered oak and some other hard woods for finishing work are being appreciated much more, and popular taste is calling for furniture and finish in native hard woods. In addition to increasing cost of Lumber, labor is getting more exacting and arbitrary, and so we need cheap Iron and Steel materials to permit a normal growth of improvement. Bar Iron is very quiet, the mills having a fair amount of business to keep in the trade with, not wishing to load up with losing orders, or perhaps could not get many at any price. Sheets are also quiet, not much doing.

The Nail trade, both Cut and Wire, is in a high state of inactivity, very little being done either from mills or store. Barbed and Plain Wire is going out in good orders to the country, but very few are the new orders booked by the mills; however, they are pretty well booked up to April 1, and if they will hold together so as to protect customers, they will do well. Such severe cutting in the Bolt business has not been indulged in for a long time as is now going on, and the jobbers will persist in giving to the retailers all the little perquisites obtained from the mills. Prices are extremely unsettled, and it is claimed that association factories are, themselves, the guilty parties. This past week money has been very close, but fairly good collections come in, keeping the supply quite equal to legitimate demand.

It Is Reported—

That the Hardware establishment of R. Bierman, Cherry Valley, N. Y., was recently destroyed by fire. The loss is estimated at \$9000; partly insured.

That John Shramm will open a Hardware store in Wahoo, Neb.

That M. F. Sherman, Hardware, Greenwood, N. Y., has disposed of his business to Smith & Shaw.

That the warehouse of J. M. Hefley, Hardware, &c., Cameron, Texas, was burned out recently. Most of his stock was, however, saved and the interruption to his business will not be serious.

That Riggs Bros. & Webster, dealers in Hardware, Guns and Implements, Glenwood Minn., have dissolved partnership

That Canfield & Murphy, Hardware, &c., Whalen, Minn., have disposed of their business to Thorson Bros.

That C. A. Myers is the proprietor of a new Hardware store at David City, Neb.

That David Matthews has purchased the Hardware business of Frank Hintzelman, Hubbard, Ohio.

That J. Russell & Co., Holyoke, Mass., have bought the stock of Hardware of Daniel Dunn, Chicopee Falls, Mass.

That H. E. Iseman, formerly in the Hardware business at Metz, Ind., has opened a Hardware store at Prattville, Mich.

That F. M. Holland and H. H. Guernsey have bought out the Hardware and Stove business of Adolph Hoffmeister, New Haven, Conn.

That D. E. McCarthy of the Hardware firm of McCarthy & Schwarzenbach, Good Thunder, Minn., has retired from the business. His interest in the firm has been purchased by August Bosin.

That A. Pierce & Son, Hardware, &c., Lake City, Minn., have dissolved partnership.

That C. A. Barnes, Hardware, has sold out to Miller & Reimer, Manning, Iowa.

That Shidler & Shidler have succeeded Jackson Bros., dealers in Hardware, &c., London Mills, Ill.

That Richards & Harker, Hardware, Mapleton, Iowa, have disposed of their business to John T. Lloyd.

That Haight & Batta have succeeded to the business of Haight & Duros, Hardware, Crete, Neb., Mr. Batta having purchased the interest of C. Duros.

That C. Mentzell is the title of a new Hardware store at Spangle Wash.

That W. C. Whitted, Hardware, Dodge, Iowa, has sold out to F. R. Hinman.

That Sheon & Slatts will conduct a new Hardware store at East Toledo, Ohio.

That J. M. Strate and James Longshore will soon take up the Hardware business at Watska, Ill.

That Mink & Webb, Hardware, &c., Galva, Ill., were recently burned out. The loss was \$15,000; partly insured.

That Lawson Barnes has bought out James Moffit, dealer in Hardware, McMinnville, S. C.

That B. S. King has purchased the stock of goods of the Weis & Ridge Hardware Company, Kansas City, Mo. The consideration is said to be \$25,000.

That the Palace Hardware Company, San Francisco, Cal., have been incorporated. The directors for the first year are Lemuel T. Lewis, Frank H. Ellis, Edmund S. Gray, Monroe Greenwood, Frank M. Greenwood and Thomas J. Shackleford.

That Lincoln & Falk, dealers in Windmills, Pumps, Implements, &c., Carleton, Neb., have disposed of their business to W. C. Bates.

Marking Prices

BY THEODORE BUTLER.

1. System of Cost and Selling Mark.

THERE are many systems in use, more or less complicated. It matters little what word, character or figure may be selected, provided a different character is used for cost and selling mark, so that the cost mark may not be used by mistake in selling goods. An example of a favorite cost and selling mark is shown in Fig. 1. The difference between cost and selling mark here is quite apparent, as it should be.

The cost mark is used in all cases to designate cost of goods, and not to mark

first of all decide upon a suitable catalogue in which to enter his prices, so that this catalogue may contain in a nutshell what his store contains and what all the goods cost and are being sold for. A price book may be substituted for an illustrated catalogue, if desired, but the catalogue is to be preferred, for the reason that this book can be used at the same time as a sales book to make sales from to wholesale customers or consumers who are not acquainted with technical terms, but can in a moment recognize in the cuts the article for which they are looking. It is also of the greatest importance that the catalogue, as corrected by the buyer, and those in use by salesmen on the road

the general book, because you must not have duplicate places for same line of goods. If a price be entered, you must know the same article does not appear elsewhere, where an old price may some time mislead you. Then you select your catalogue for Fittings and Pipe—say, Crane Company's.

You have now three moderate sized catalogues: *General Hardware, Builders' Hardware, Pipe and Fittings*. If not too large, bind them together, but they are easier to handle separately. In this catalogue are entered the prices, under proper headings, preferably by the buyer, who has had in view a certain plan in buying the goods, and who now should put this plan into execution.

A general catalogue contains all the leading lines of goods, and it will not be difficult to adapt your stock to such a book. Give a number to all goods so far as possible, if they are not numbered by factories, to avoid mistakes in filling orders, and see that the numbers appear on the original packages. In order to adapt your stock to the catalogue you may have to renumber some of the stock, while in other cases it will be easier to change numbers in catalogue. This is, of course, preferable, as it is easier. You may purchase from one manufacture a line of

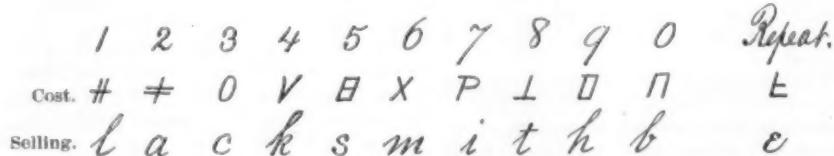


Fig. 1.—Characters for Cost and Selling Marks.

the selling price. Some people prefer to use the selling mark for all selling prices. We prefer to make an exception by marking the highest retail price in plain figures, as illustrated in Fig. 2. Scythes are seldom retailed by the dozen, but shovels are, and therefore we have a dozen price for them at retail. "D" means dealers'; "R" means retail.

The strictly retail dealer of course has not this dealers' price to note, but he marks his quantity price in selling character, his retail piece price in plain figures. Never fear your competitor, but have him fear you. If by this method he should be able to find out your selling price it does not matter, he can find it as well if your goods are marked in characters. But you may not want your customer to know what he can buy a gross of packing needles for if he wants to buy one only. The customer likes to see plain figures,

should be exactly alike. Locating changes can be more easily done by referring to pages and cuts in a catalogue than to the pages of a price-list, in making quotations to traveling salesmen.

No Hardwareman can get along without a record of prices, and if he has not commenced to do this, let him start at once. In the catalogue or price book are entered by the buyer the cost and selling prices of the goods as soon after receipt of bill as possible, even before the goods are checked, so that no matter what mistake might occur in the store and through costs or selling prices may get lost, this book gives the information required at all times. It is the store in pocket edition.

In using a catalogue its selection is of importance. We will explain how we came to a conclusion in regard to this matter, carrying on as we do a general Hardware business, also deal in Tinware and

V 17% D cc % %
R cb %

Fig. 3.—Marking in Catalogue Goods Subject to Discounts.

Screw Drivers, No. 50, at a certain cost, and when the stock gets low in one size fill up with a No. 3 of another maker, about same grade Screw Driver. Certainly you would mark this over to No. 50, and enter under this number in catalogue. If the whole line or the bulk of these Screw Drivers were No. 3 of the new incoming number, we should prefer to mark No. 50 over to No. 3 in book and shelves. For new lines secure either sheets or illustrations, and insert in proper place and index. That much for the general plan. Book and stock must correspond as to numbers.

How to Enter Prices.

Some lines of Hardware have regular list prices and are subject to discounts, as in Fig. 3, Coal Shovels, the cost on the left and selling price on the right of the page above means:

Coal Shovels cost 40 per cent. off.
Sell to dealers at 33% per cent. off.
Sell to consumers at 30 per cent. by the dozen.

The retail piece price should be put opposite each number on margin in plain figures. All the prices should be established in this book upon receipt of bill.

Articles which are not sold by the dozen at retail do not need this item.

#4 scythes BNT per dz. D mer per dz R 65 cents each
• #5 shovels DNT per dz. D mer per dz R 15 per dz 75¢ each

Fig. 2.—Showing Highest Retail Price in Plain Figures.

and you must make them such that you can stick to them. If you find that you must reduce them, do so yourself, as you cannot get more money from any one for the same goods than you neighbor. A limited use of plain figures, as above, will do no harm; if you have dealers dealing with you they will like it, as you surely are doing business squarely, and make no secret of your retail figures, and you can help them to get a margin above their (the dealers') price, by establishing a fair price for the article in an open way.

2. Marking Prices for Office Use.

Every dealer, when he starts in business, —i. e., in the Hardware business—should

House Furnishing Goods, Agricultural Implements, Pipes and Fittings.

For general Hardware a jobber's catalogue is best adapted, because it contains a variety of goods, and usually the selection of staples is mostly carried. Look carefully which book suits your present or prospect of stock best. Then settle on that one. But it may contain in Builder's Hardware what is not suitable for you. It shows another line of goods from those you are handling, and Builder's Hardware should not be a mixed stock, and cannot conveniently be marked and numbered over. Use the catalogue of your Lock maker for these goods, and cut it out of

Others need different designations, as in Fig. 4, Tacks, which means:

	Per cent.
Tacks cost.....	80
Sell to dealers.....	75
At retail, in 25-pound lots.....	73
At retail, in 5-pound lots.....	70
In smaller quantities, at.....	60

It would be too laborious in this instance to figure out all the sizes in catalogue.

By comparison with the catalogue discount it should be ascertained whether the stock man, having stocks in

quantity it will be possible and necessary to note changes to them immediately, when they come to the ears of the buyer, to prevent orders from being taken at old prices immediately after heavy advances.

The traveling men must have the exact duplicate of the office catalogue, so that reference can be made in noting price changes to the pages in their catalogues as soon as they are received.

It is of equal importance to have the office catalogue in good order, and mark

are only marked where numbers and sizes or other information is not given.

We think it is unnecessary to go into details in regard to marking goods in wholesale sample rooms, as the principle above is plain and usually carried on at present; and because in principle the two systems—one for retail and the other for wholesale department—are alike. The difficulty seems to be to provide a system for marking goods in a retail store. It is impossible to provide a system for this purpose for a dealer who has no system of sampling goods. In a modern store the shelves are provided with drawers, the faces of which show the contents of the drawers. These are for shelf goods. Each drawer contains a certain line of goods—for example, different patterns of Sash Lifts, Drawer Pulls, Sash Locks—and the contents of drawers should not be crowded. On the top edge of drawer face is noted the number of the article sampled below.

Provide the inside of drawer with a tag, attached with a hard twine to a screw eye, so that it may easily be detached

11% Dis %
25 lbs 5 lbs
R ic ib Less 60 %

Fig. 4.—Catalogue Markings of Tacks.

charge, has figured them correctly on his price card, and has followed instructions. There is another reason why this entry of prices into a price book is of importance—viz., to discover, when new invoices are received, if the goods are already in stock and proper price cards made, or if there is a change in price, which would necessitate a general revision of wholesale and retail prices. If the goods have been in stock before, and there is no change in price, it shows us that it is only necessary to put the goods in stock without changing prices or any marking whatever.

Attached to the invoices, when they leave the buyer's desk, should be full directions for receiving clerk how they should be marked; whether numbers should be changed or not; whether they need sampling, being new goods, and at what prices they should be sold, which directions follow the goods until they are properly sampled in the proper department. At the same time notices are sent to the traveling men of the receipt of new

prices for use of salesmen at stores, which brings us to the fourth point.

4. Marking Prices in Store.

The salesman who cannot promptly reply to an inquiry for price of an article

Limerick Fish Hooks.

Nos 60, 70, 80, 90, 100, 110, 120
per 100 HOB - HOB HOB 10 PH XV BL
D. per 100. lab - lab las lab lab lab ms
R per 100 lis - lms - lsb lis - lab - lab - ts

R doz 20 15 10¢

Fig. 6.—Marking of Fish Hooks, on Tags.

or a line of goods cannot command the confidence of the would-be purchaser, be he a farmer, mechanic or dealer. Therefore the goods must be marked in store, so

from drawer for making changes in prices. For instance, Fig. 5, a drawer contains four different patterns of Drawer Pulls; the edge of drawer front is marked as in Fig. 5.

At first glance the clerk sees that samples of Drawer Pulls Nos. 25 and 35 are those appearing on top row, and Nos. 250 and 350 on bottom line of drawer face. If the inside should be mixed up it does not matter, as these samples will identify them at once. The card gives list price, selling price per gross and per dozen, cost in discount and dealers' price in discount from list.

It is better to mark cost price in discounts, also selling price to dealers in discounts, so that slight changes may be made without changing the whole card. Where net cost prices are used—as will be unavoidable in many instances—the net cost takes the place of list, but the general features remain the same, as illustrated in Fig. 6. This card gives cost of Limerick Fish Hooks per 100, price to dealers and at retail per 100, price per dozen. Cost and selling prices are always marked in pencil, so that they can be changed. This system is good for all goods kept and sampled in drawers or boxes, especially Shelf Hardware and Tools, Augers and Bits, &c.

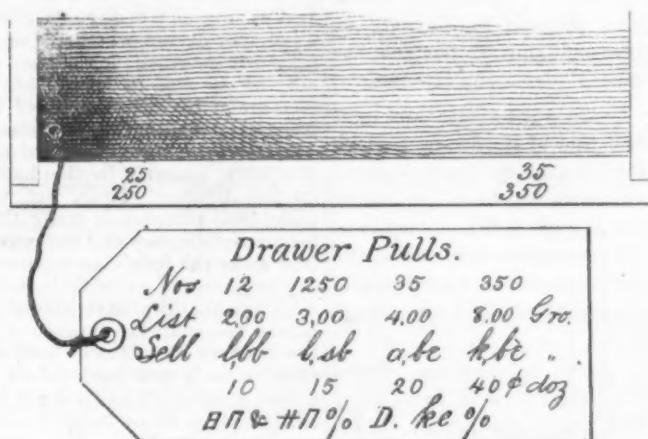


Fig. 5.—Marking of Goods in Drawers, on Tags.

goods, and prices explained, which brings us to

3. Marking Prices for the Use of the Traveling Men.

As a matter of course, the traveling men must hear of changes of prices and of new goods as soon as possible. Fre-

that all information can be obtained promptly. In a store where wholesale and retail business is carried on there usually is a special wholesale department, with a complete line of samples and a separate price card system, each card covering a line of goods, while the goods themselves

When these cards are once made it is unnecessary to mark packages, as the goods are sold from these drawers, not from stock, and remain good until a change is ordered from the buyer's desk. But many goods cannot be kept in drawers, as they are bulky. The price card system, as hereafter named and exemplified, is most proper. This price card covers a certain line and serves as a guide to the stockman, who uses it to mark his retail samples or stock by, and also by examining same is continually reminded of the goods which are in stock and not sampled, and to be brought down from the warehouse. This line comprises such goods as Woodenware, Stamped Tinware and Pieced Tinware, Metals, Cartridges, Rope, Japanned Ware, Cast Iron Ware, Steel Goods, Shovels and many others.

Of course no man would think of marking each package of Tacks or Bolts or

to know whether he is buying a 5, 7 or 10 gallon Churn.

The price cards, of course, must be placed at some convenient point, near the goods which they represent, provided with a chain about 4 inches long, hung to a screw eye, opened just far enough to allow the chain to be inserted, as they should not be removed from their place except for the purpose of changing prices.

Goods which are removed from their regular places, from drawers containing price cards, must always be provided with duplicate tickets to avoid delay in naming prices.

The principle above described gives to one man, usually the buyer, the task of establishing the prices, and to his stock men the duty of executing his orders and marking the details. Laborious as this work may seem, if you have not yet started it, it will take many months to carry it

sold and continually replaced from stock when sold.

We think that with the general principles described in these lines, the Hardwareman will have no trouble in finding the most desirable plan of marking prices in each individual case.

Warranting Edge Tools.

WE HAVE RECEIVED the following communication from a prominent Hardware man in Kentucky who presents the subject in an interesting manner:

We have read with no little interest the articles upon the warranting of Saws, Axes and other Edge Tools. The warranting lever is doubtless too frequently used to close a sale with a customer who is slow to make up his mind about what he really wants. In fact, he don't know what Axe or Saw would be the best. He is urged to take the article on the ground that it is warranted and if it is not good he can bring it back. Inexperienced men and boys destroy really good tools for apparently no other reason than to bring them back and have them replaced by new ones. We warrant very few tools now and when the customer takes the precaution to ask about a warrant we are almost sure not to warrant the article he wants, as it turns out nine times out of ten that he is a destroyer of tools for no other reason than to have them replaced by new ones. We have had all the stereotyped faults of tools used for generations past, brought to serve as excuses for bringing back tools, but here is an original one. We sold a customer a Saw in the winter, it being rusted. A salesman after making a reduction in the price found it necessary to assist the sale with a warrant. After about four weeks the purchaser returned the Saw and said it was no good. Our clerk asked if it was hard to run? No. Did not the set stand? Yes, it stood all right. Was it too hard or too soft? No, it was not, but it made too much noise. It made more noise than a bass fiddle. As he was backed by two brothers and three neighbors it was a question of another Saw or a row. He got the Saw. This serves to illustrate that many times another tool is given simply to prevent any ill feeling. Just as soon as a dealer sets himself up as a judge to decide whether the article returned is returned for a good reason or not, he is sure to incur either the displeasure of his customer or of the manufacturer.

As he was backed by two brothers and three neighbors it was a question of another Saw or a row. He got the Saw. This serves to illustrate that many times another tool is given simply to prevent any ill feeling. Just as soon as a dealer sets himself up as a judge to decide whether the article returned is returned for a good reason or not, he is sure to incur either the displeasure of his customer or of the manufacturer.

The customer, being present, generally gets the benefit of the doubt. We were formerly in the habit of warranting Coopers' Tools, but we had so many tools returned it made the business both unsatisfactory and unprofitable. We now make the following warrant only: If the purchaser of a tool finds the temper or working qualities unsatisfactory he is required to pay all the expense of returning the tool to the factory and the return charges on a new tool. Now we never have a Cooper's Tool returned unless it is really bad, as an exchange costs almost as much as a new tool. The same make of Coopers' Tools which have given us so much trouble in the past now prove to be well tempered. There is reason in all things, but most purchasers of Edge Tools seem only to desire to benefit themselves.

Sometimes we have a tool returned that shows it was evidently made of poor material, had a flaw in it or was otherwise defective. In such cases we replace the tool, even though there was no warrant given on it. We have long since concluded there is no halfway place to be found in the warranting business.

Description	Size	List	cost	Job	Sell
chisholm scoop					each
No 850	5	14.75	{ 05% " 15.50	cc 1/4% #17	1.00 1.10
" 860	6				
" 870	7	16.25			1.15
R per dozen					16%

Fig. 7—Root's No. 33 Price Card, Filled Out.

Screws, but the reference to price card alone is sufficient for these goods. But bulky goods—like Shovels, Steel goods, Japanned Ware, Tinware—should be marked individually for retail purposes. When taken from stock to retail room should be marked with selling prices in plain figures only, as information as to cost and wholesale price may be gained from the cards without trouble.

Root's Blank Price Cards, No. 33, have been found the most convenient for making price-lists of goods. His Bolt and Screw Lists, or any of the lists containing sizes, are not practicable, because they are not complete, and because stock usually contains more or a different variety of sizes than given in them. Fig. 7 illustrates one of Root's No. 33 cards filled out. This card gives number and size of Scoop list price—cost price, selling price to dealers, selling price at retail per dozen and per piece. This is all the information needed, and it also reveals to the stock man at once what is carried in stock, and if stock is low he can report this fact at once.

An important item in marking goods also is to convey information to the salesman necessary to effect sale. In marking a No. 1 Union Churn, you should add capacity—5 gallons, as the farmer who is about to buy a Churn will certainly want

through, but once established will reduce the work to a minimum.

Some men may say that the system is not possible where goods are sold from original packages, and where no samples or drawers exist. To these we would recommend that they get the drawers or sample boards and start in business, as their ways are antiquated and obsolete.

Showcase Goods.—Showcases are used to show a fine line of Hardware, such as fine Tools, Pocket Cutlery, Table Cutlery, &c., and therefore no boxes in which such Hardware is packed should appear in showcase. A fine showcase, with the goods tastefully displayed, is a good investment. If showcases are used for storage they are useless.

All goods shown in showcase, therefore, should be marked with small tags, and when sold the tags should be removed and put in the place where the article sold was laying, so that the stock man can at once replace the article from stock. Pocket Knives look best when displayed openly on trays of different width in showcase, in rows of three to four sizes, one raised above the other. Sample three Knives of a kind, tag one only, laying the two others next it. This marked sample Knife remains in showcase until stock is all sold, while the other two are being

It must be absolute or no warrant at all. The last is decidedly the best plan. An article of merit will sell without a warrant, but will be much slower to come into general use for not being warranted. We believe the sooner the warranting of tools is abandoned the better for all parties concerned. It would be by no means a difficult task to write a book on warranting.

Exports.

PER BARK B. WEBSTER, MARCH 30, 1891,
FOR ADELAIDE, AUSTRALIA.

By Lalance & Grosjean Mfg. Company.—23 cases Household Utensils.
By Fairbanks & Co.—15 boxes Scales.
By McLean Bros. & Rigg.—12 dozen Locks, $\frac{1}{2}$ dozen Air Guns, 12 dozen Rat Traps, 2 dozen Wrenches, 16 cases Reapers and parts, 6 gross Belt Studs.
By W. H. Crossman & Bro.—12 packages Plated Ware, 15,500 Iron Bolts, 18 dozen Scythes, 6 Plows, 1 case Pump parts, 200 feet Rubber Hose, 1 gross traps, 3 cases Agate-ware, 1 dozen Lanterns, 190 pounds Axles, 1 gross Traps, $2\frac{1}{2}$ dozen Locks, 12 dozen Glue, 2 cases Hardware.

By H. W. Peabody & Co.—6 case Agate Ware, 5 cases Axles, 14 dozen Wringers, 2 cases Freezers, 9 crates Refrigerators, 30 cases Hardware, 28,000 pounds Barb Wire, 27 packages Hardware, 2 cases Oil Stoves, 4 dozen Wringers, 14 crates Stoves, 1 case Razor Strips, 20 packages Lamp Ware, 2 cases Garden Hose, 5000 Cartridges, 1 case Agate Ware, 9 cases Hardware, 2 packages Pumps, 1 case Curry Combs, 1 package Bits, 1 cask Pumps, 2 Hardware, 4 dozen Wringers, 7 cases Hardware, 1 case Agate Ware, 1 case Rat Traps, 1 case Hardware, 24 packages Bird Cages, 3 packages Lamp Ware, 1 case Cork Pullers.

By R. W. Forbes & Son.—3 boxes Drills, 6 barrels Hardware.

By Healy & Earl.—25 Hay Rakes.

PER BARK GALATHEA, MARCH 31, 1891, FOR ADELAIDE, AUSTRALIA.

By Adriance, Platt & Co.—5 packages Binders, 99 packages Reapers and Mowers.

By H. W. Crossman & Bro.—4 packages Plated Ware, 10 cases Household Goods.

By R. W. Forbes & Son.—4 packages Hardware.

By Australasian-American Shipping Company.—2 cases Forks, 31 cases Forks, 5 cases Forks.

By Arkell & Douglas.—60 Agricultural Implements, 260 dozen Rake Handles, 1 dozen Pumps, 60 dozen Rakes, 6 dozen Locks, 22 dozen Saws, 6000 Wood Levels, 300 yards Wire Cloth, $\frac{1}{2}$ dozen Pumps, 15 dozen Axles, 16 dozen Miter Boxes, 20 dozen Axes, 20 Mowers.

PER BARK HABIL, APRIL 1, 1891, FOR FREE-MANTLE, AUSTRALIA.

By W. H. Crossman & Bro.—2 cases Carriage Hardware, 10,000 Metallic Cartridges, 1 case Agricultural Implements.

By Mailler & Quereau.—1 case Air Guns.

By Arkell & Douglas.—12 dozen Hatchets, $2\frac{1}{2}$ dozen Churns, 3 dozen Brushes.

By R. W. Forbes & Son.— $2\frac{1}{2}$ dozen Store Trucks.

By H. W. Peabody & Co.—6 cases Edge Tools, 736 pounds Nails, 117 packages Hardware, 2 dozen Hoes, 21 dozen Hay Forks, 1140 pounds Bolts, 1 case Agricultural Machinery, 90 cases Cartridges, 3 cases Guns, $\frac{1}{2}$ dozen Wringers, 6 packages Stepladders, 7 packages Lampware, 1 case Hammers, 2 packages Twine Boxes, 4 cases Lawn Mowers, 1 case Pump, 1 case Hay Rakes, 3 cases Agricultural Implements, 6 crates Stoves, 5 packages Hardware, 11 cases Axles, 1 case Pumps, 1 case Mouse Traps, 2 cases Reapers, 1 case Thermometers, 7 racks Churns, 3 cases Hardware, 1 case Carpet Sweepers, 1 package Glass Cutters, 2 cases Hardware, 1 case Plated Ware, 20,000 Cartridges, 6 cases Edge Tools.

PER BARK CUBA, APRIL 6, 1891, FOR PORT NATAL, SOUTH AFRICA.

By C. W. Haynes & Co.—1 case Cash Registers.

By Corner Bros. & Co.—112,000 pounds Barb Wire.

By H. W. Peabody & Co.—3 Crates Stone, 6 packages Builders' Hardware, 1 case Lamps.

By W. Crossman & Bro.—99 cases Agricultural Implements and parts, 100 kegs Nails, 44,800 pounds Barb Wire, 9 packages Agricultural Implements and parts, 2 dozen Churns, 1 case Pumps, 1 dozen Washing Machines, 5 packages Scales, 442 cases Agricultural Implements and parts, 5 crates Agricultural Implements.

PRICE CARDS.

A. SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo., are sending out conveniently arranged price

they have but recently occupied Clark, Quien & Morse, Peoria and Chicago, Ill., send a retailers' mail price card, on one side of which are given Cut Nails and on the other side Wire Nails. The style of

3-8 INCH.

LENGTH, INCHES.	LIST.	COST.	SELL.	
			Per 100.	Each.
1 $\frac{1}{2}$	\$2 30			
1 $\frac{3}{4}$	2 30			
2	2 30			
2 $\frac{1}{4}$	2 40			
2 $\frac{1}{2}$	2 50			
2 $\frac{3}{4}$	2 60			
3	2 70			
3 $\frac{1}{4}$	2 80			

Carriage Bolt List of A. F. Shapleigh Hardware Co.

cards of Carriage Bolts and Screws, for use in retail stores. These are on colored cardboard 11 x 14, provided with an eyelet

3-8 INCH.	0	40							
	1	40							
	2	40							
	3	40							
	4	40							
	5	40							
	6	41							
	7	48							
	8	55							
	9	62							

Screw List—A. F. Shapleigh Hardware Co.

for hanging. We reproduce a portion of each. The Carriage Bolt list includes all sizes from $\frac{3}{16}$ x 1 inch to $\frac{1}{2}$ x 20 inches.

the Wire Nail card is shown below. The card is $5\frac{1}{2}$ x 9 inches, with eyelet for hanging, the lower part unoccupied by price-list being devoted to their advertisement. The practice of jobbers furnishing their customers with conveniently arranged lists of this kind is commendable, as it provides retailers with reliable and convenient price cards for store use.

French Porcelained Ware.

THE BRONSON SUPPLY COMPANY of Cleveland, manufacturers of the Never-Break steel hollow ware, have just put on the market a new line of goods styled "French porcelained ware." The body of this ware is the same as in their Never-Break goods, with a coating of fine purple porcelain on the outside and fine white porcelain on the inside. The demand for goods of this character has led the company to make a long series of experiments with various coatings, although they were advised by manufacturers of great experience in making enameled ware that it would be impossible to enamel steel satisfactorily. Yet they have finally succeeded, and now, after

60d Common Nails Base Price \$				Per Keg. Add for Freight C.					
Nails.	Length.	Advance Above Base.	SELL.		Fence.	Length.	Advance Above Base.	SELL.	
			Per Keg.	Per Pound.				Per Keg.	Per Pound.
3d Fine	1 $\frac{1}{2}$ in	2.00	.....	.....	6d	2 in	.65	.....	.....
3d Com	1 $\frac{1}{2}$ "	1.50	.....	.....	8d	2 $\frac{1}{2}$ "	.50	.....	.....
4d	1 $\frac{1}{2}$ "	.90	.....	.....	10d	3 "	.40	.....	.....
5d	1 $\frac{1}{2}$ "	.90	.....	.....	Casing.				.....
6d	2 "	.65	.....	.....	4d	1 $\frac{1}{2}$ in	1.50	.....	.....
7d	2 $\frac{1}{2}$ "	.65	.....	.....	6d	2 "	1.25	.....	.....
8d	2 $\frac{1}{2}$ "	.50	.....	.....	8d	2 $\frac{1}{2}$ "	1.00	.....	.....
9d	2 $\frac{1}{2}$ "	.50	.....	.....	10d	3 "	.90	.....	.....
10d	3 "	.40	.....	.....	12d	3 $\frac{1}{2}$ "	.80	.....	.....
12d	3 $\frac{1}{2}$ "	.35	.....	.....	Finish'g				.....
16d	3 $\frac{1}{2}$ "	.35	.....	.....					.....
20d	4 "	.30	.....	.....	6d	2 in	1.50	.....	.....
30d	4 $\frac{1}{2}$ "	.20	.....	.....	8d	2 $\frac{1}{2}$ "	1.25	.....	.....
40d	5 "	.20	.....	.....	10d	3 "	1.00	.....	.....
50d	5 $\frac{1}{2}$ "	.10	.....	.....					.....
60d	6 "	.....	.....	.....					.....

Wire Nail Card.—Clark, Quien & Morse.

A space $3\frac{1}{2}$ x $5\frac{1}{2}$ inches in the center of each of these lists is devoted to a perspective view of their new building, which having thoroughly tested the new ware in every respect, they offer it to the trade with the confident belief that it

will be found perfectly reliable, the most violent treatment failing to make it chip or scale off. The company now make a complete line of their Never-Break Ware in mirror polished, tinned or porcelainized. A new catalogue of their goods is now in course of preparation and will be issued in two or three weeks. Quite an important matter in connection with these goods is their recent adoption by the proper bureaus for use in the army and navy. The company also have the promise, if not too late for this year's proposals, that their ware will be specified for the Department of Indian Affairs. Two new ships of the navy are to be fitted at once with their goods, and proposals have already appeared under army auspices in which the Bronson Supply Company's ware, "or equal," is called for. The general trade of the company shows continued growth, not being affected by dull times.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

The market has presented few features that contrast with those that characterized the operations of buyers and sellers since the opening of the spring season. Nothing has transpired in the position of base materials that would have any pronounced effect upon operations in the various prepared pigments, or upon values of the same, and, as regards general distribution, the demand and the attitude of sellers, it can only be said that the conditions are practically the same as usual at this season of the year. In other words, there is hardly a ripple on the surface, and distribution is going ahead in a fairly satisfactory manner, although affording no cause for particular enthusiasm.

White Lead.—The market is wholly devoid of new or striking features. Corroders report a steady run of orders for their products, and manufacturers of Mixed Leads state that sales are fully up to the average. In some instances, as a matter of fact, the movement of the cheaper varieties is represented as being ahead of that of the corresponding period last year. As for prices, they seem to be very steady all along the line, and at present there are no signs of any radical change in the immediate future. The corroders manifest no desire to wage war upon the manufacturers of cheap pigment to the extreme of "cutting" rates, and the position of the market for the various base materials tends to check intemperate competition among manufacturers of Mixed Leads.

Zincs.—In this line there has been no change whatever. Between the deliveries making on old contracts and the filling of new orders that come along the output of American product is closely taken up, and that fact, in connection with harmonious relations between manufacturers, serves to keep values firm. Arrivals of foreign brands, while fairly large, are little, if at all, in excess of market requirements, and these, as well as the domestic Oxide, are selling at full former prices.

Red Lead and Litharge.—Orders are fully up to the average for the season, and the movement of supplies from first hands is sufficient to keep surplus stock within manageable bounds. Prices remain firm and without quotable change.

Colors.—The most noteworthy change in this line is a reduction in price of Quicksilver Vermilion by the associated manufacturers to 64¢ per lb for kegs of 100 lb or more, 65¢ for bags of 30 to 50 lb and 69¢ for less than a bag, usual terms. Outside manufacturers are at about 2¢ under those

prices. Buyers who had been holding back in expectation of the change have placed orders with some freedom, making a fairly large movement for the week. Venetian Red has been moving rather more freely, but at unchanged prices. In other Reds there is about the customary business passing and values are steady. Greens, Blues and Browns are without change in value and find steady sale. The movement of Oil Colors and Ready-Mixed Paints continues free.

Miscellaneous.—Block Chalk in bulk has been sold, for prompt sail shipment, at \$3 7/8 ton delivered here, showing a very firm market. Spot supplies are light, as the bulk of current arrivals go direct to consumers. Very fair orders are still coming in for Whiting and Paris White and prices remain steady. On prices for Barytes, China Clay, Terra Alba and Talc there is no radical change to note, but supplies, except of Barytes, are more liberal and purchases are made with less difficulty at old figures.

Oils and Turpentine.

A more uneventful week than has been experienced in this line could hardly be imagined. Fluctuation in prices of Lard have had more or less bearing upon prices of various lubricants, yet no radical changes have taken place, and it does not appear that business has been affected in any marked degree. Otherwise nothing has transpired that had even as much as a superficial influence upon values or the movements of buyers or sellers, and at present the indications are favorable for a good, steady distribution and steadiness to values.

Linseed Oil.—Local and outside crushers seem to adhere faithfully to the agreement entered into some time ago, and business proceeds without friction, in this locality at least. City brands, as usual when the difference between prices for the same and those of outside product is so little, receive by far the greater share of attention, but interior and Western brands are faring relatively as well in their particular fields, and the shipments to this quarter are moderate. Speaking in a general way, the market retains good form under the influence of harmony among producers, and steady demand.

Lard Oil.—Buyers seem to have gained confidence from the fact that prices of raw material, while showing more or less irregularity, are unlikely to decline materially in the immediate future, and the fact that pressers have been working closely to orders serves also to give the market tone. Transactions in Oil have been larger the past week than at any previous time since the advance in values, and buyers heretofore backward have paid 53¢ @ 54¢ for round lots and 55¢ for single barrels, with comparatively little ceremony.

Cotton Seed Oils.—The comparatively high point to which values have been forced lately seems to check export operations and also restrains purchasers for home account in some degree. In point of fact there has been a general tendency on the part of large buyers to hold back. However, several deals involving good-sized lots have gone through during the past few days at prices showing that the market has lost nothing in tone. The most important transaction was a sale of 3000 barrels refined Summer Yellow for shipment from New Orleans to Trieste.

Fish Oils.—Pressed and bleached Menhaden and manufactured Sperm and Whale Oils have been selling in ordinary jobbing quantities at full former prices to a very fair extent. Nothing new has developed in the market for the crude Oils, however, and prices for the same stand

practically the same as they were a week ago.

Miscellaneous.—No further change has taken place in prices for Cocoanut Oil, but the market has gained somewhat in tone under the influence of several purchases of fairly good-sized lots on the spot. Olive Oil is without change in price and meets with merely ordinary demand. Palm Oil is in fair demand and steady. Cod Oil is held at "fancy" prices, being scarce.

Spirits Turpentine.—Prices have improved to the extent of about 4¢ 7/8 gallon and the market is steady at the advance. The change, however, seems to be due almost wholly to smaller offering, as there is little, if any, increase in the trade demand.

At a meeting of the Pittsburgh Committee of Freight Agents of the various lines leading into that city, held there on Monday the 6th inst., it was arranged to reduce the freight rates on articles of iron and steel manufacture in accordance with the Joint Committee Circular, No. 1258, dated at New York, April 4, 1891. In accordance with the above, the fifth and sixth class rates per 100 pounds on articles of iron and steel manufacture from Pittsburgh, McKeesport, Rankin Station, Braddock, Beaver Falls, Phillipsburg, New Brighton, Rochester and Chartiers to points given below are as follows:

To	Less than carload lots.	Carload lots.
Syracuse, N. Y.	\$0.14	\$0.12 1/2
Albany, N. Y.	.18	.15
New York City, N. Y.	.18	.15
Boston, Mass.	.21	.18
Philadelphia, Pa.	.16	.13
Baltimore, Md.	.15	.12
Portland, Maine.	.26 1/2	.22 1/2
Oswego, N. Y.	.16	.13
Utica, N. Y.	.16	.13
Rochester, N. Y.	.12	.11
Richmond, Va.	.20	.16
Savannah, Ga.	.27	.22

The rate to Savannah, Ga., is a rail and sea rate. These new rates go into effect on Monday, the 13th inst., and will expire on August 31, 1891.

Coal Market.

The Anthracite Coal market has not been perceptibly affected by the issue of spring prices, which remain at the lowest figures, and are irregular, at least so far as concerns individual operators. The latter have made no change for some weeks, except as to the small steam sizes, which are in demand, Buckwheat selling at \$1.80 @ \$2, f.o.b., according to grade, and Pea, \$2.40 @ \$2.85. The Philadelphia *Ledger* says: "Buyers are holding back their orders awaiting the action of the Lehigh Valley Railroad, which has been ordered by the Interstate Commerce Commission to reduce its tolls on Anthracite on the 20th inst. In well-informed Coal circles it is not believed that the Lehigh Valley Railroad will reduce its tolls, but it is expected that that company will force Coxe Bros. & Co. to take further legal action in the matter." New York agents notice the same disposition to delay purchases, apparently in hope of a change in buyers' favor. Broken is a little firm, on account of the furnace trade taking anthracite in the place of Coke. A Kingston dispatch speaks of a cut rate war in Coal prices between the Delaware and Hudson and Pennsylvania Coal companies. A sweeping reduction of from 60¢ to 75¢ per ton was made. It is announced that the Reading New York Central traffic arrangements are completed. The principal change is in regard to Coal rates, the Reading getting 12¢ per ton more on west-bound Coal than before.

Real Bronze Lock No. 411.

Keystone Lock Works, E. T. Fraim, proprietor, Lancaster, Pa.; Surpless, Dunn & Alder, 97 Chambers street, New York, agents, are putting on the market padlocks, as illustrated herewith. They are self locking, spring shackles, with all bronze tumblers, operated by a double

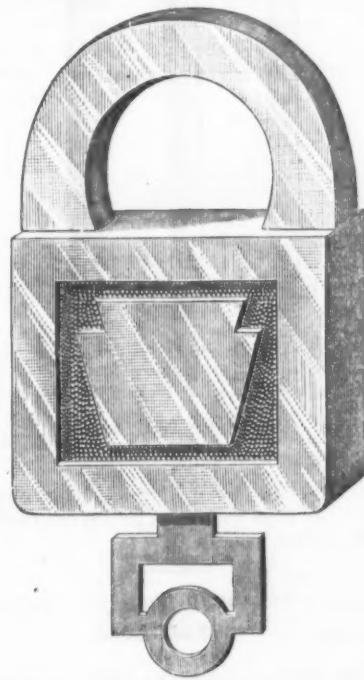


Fig. 1.—Real Bronze Lock No. 411.

bitted nickel plated flat steel key. The springs are of phosphor bronze, placed flatwise, and securely bound in their respective positions. The locks have revolving cylinder key guides, with two keys to each lock; packed half a dozen in

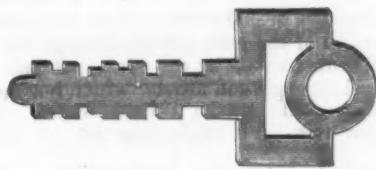
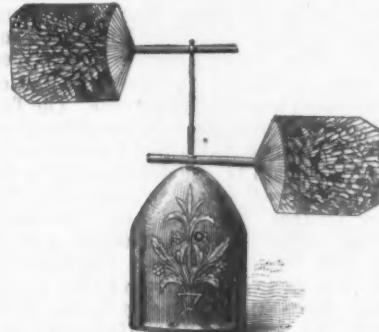


Fig. 2.—Key for No. 411 Padlock.

a metal bound box, changes all different. The finish and general appearance of these locks are especially referred to, and the point is made that they are proof against rust, corrosion or dust.

Portable Automatic Cooling Fan.

H. L. Arringdale, Radford, Va., is introducing a fan, as illustrated herewith. The device is actuated by clock work,



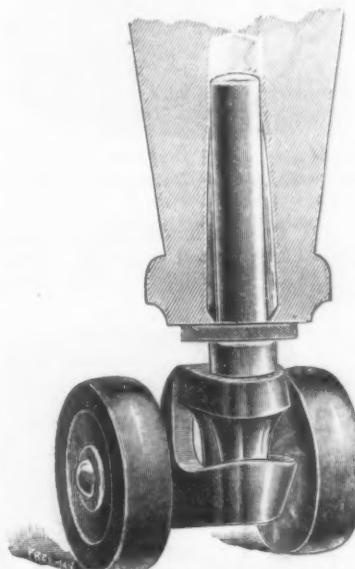
Portable Automatic Cooling Fan.

which, when wound up, runs an hour, revolving one fan in one direction and the

other fan in the opposite direction. It is claimed that these fans, running horizontally and in opposite directions, will fan a circle of persons as well as one person; that it is perfectly noiseless in its operation, and is well finished, making it an ornamental as well as a useful article. The moderate price at which it is offered is also alluded to.

Drive Stem Caster.

Gwinner, Dowrey & Co., Hamilton, Ohio, are introducing a caster, as illustrated herewith. The caster is made entirely of malleable iron except the wheels, which are either gray iron or lignum-vitæ. They



Drive Stem Caster.

are designed to take the place of the single wheel Philadelphia caster. For attaching it requires only a hole to be bored, and the stem driven in. These are made in five sizes; adapted for use on parlor chairs, to the larger sizes required for bookcases, sideboards, &c.

Nail Mill Tote Box.

W. J. Clark & Co., Salem, Ohio, are introducing a tote box for nail mills, as illustrated herewith. This is made of No. 18 gauge sheet steel, so cut and



Nail Mill Tote Box.

formed as to make the corners and ends to which the handles are fastened of double thickness. The box is 18 inches long, 10 inches wide and 5 inches deep. Its capacity in weight of wire nails is from 25 to 100 pounds, according to the kind or size of nails. The boxes nest, so ten or a dozen can be moved rapidly about the works by one man. These tote boxes are designed to replace the wooden boxes usually used in nail mills for handling the nails before they are packed for market. It is claimed that the sheet-steel boxes will not break with rough handling and constant use, as wooden boxes do. The

manufacturers state that these tote boxes have been adopted by the Findlay and Salem wire nail mills, and also by the New Castle wire nail mill.

Cream City Flue Stop.

Geuder & Paeschke Mfg. Company, Milwaukee, Wis., have put upon the market the Cream City Flue Stop, an illustration of which is given herewith. These flue stops are very attractive in appearance and are tastefully decorated with



Cream City Flue Stop.

red or red with gold finish, giving a pleasing combination of colors. The stops are packed in pasteboard boxes containing one dozen each.

Western States Commercial Congress.

At the first Western States Commercial Congress, to be held in Kansas City from April 14 to the 18th inclusive, papers will be presented by men of distinction and national reputation upon the following subjects submitted by the Executive Committee for discussion:

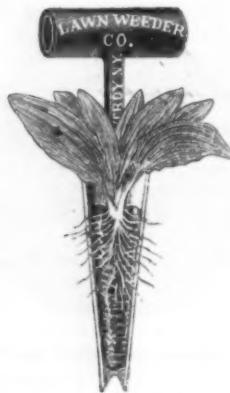
1. General business and agricultural depression; cause and remedy.
2. Legislation as affecting commerce, transportation and finance.
3. Transportation and improvement of waterways, lake, gulf and Pacific ports.
4. Markets for Western products.
5. Free coinage, metallic money and paper currency.
6. Promotion of manufacturing interests.
7. Irrigation of arid lands.
8. Uniform commercial laws.
9. Taxation.
10. Western mineral lands and their development.

11. Immigration and settlement of unoccupied lands.
12. Cause and effect of business combinations and trusts.
13. Reciprocity and international trade extension.
14. Federal and State statistics.
15. The Indian question and opening of Indian lands.

The loss of the sugar duties at Philadelphia will place Boston foremost in dutiable commerce. Last year her custom house receipts exceeded \$28,000,000, one half of the amount coming from raw sugar.

Universal Lawn Keeper.

Palmer Hardware Mfg. Company, Troy, N. Y., W. H. Jacobus, 90 Chambers street, New York, agents, are introducing a lawn keeper, as illustrated herewith. It consists of a blade semicircular in cross section, tapering toward the point, and connected to a handle by a shank, all of which is cast in one integral piece of steel, and coated with tin. It is designed to eradicate weeds from lawns. The blade is held in a vertical position beside the root to be



Universal Lawn Keeper.

removed; after it has been pushed down beside it, it is given a half turn to cut entirely around the root; it is claimed that the root with all its fibers unbroken will be left in the blade, as shown in the illustration. The manufacturers state that by its use more is accomplished in an hour in keeping lawns free from weeds than can be accomplished in a day by any other means. The tool is also recommended for potting and for transplanting flowers and plants.

Sure Grip Board Rule Handle.

The Lufkin Rule Company, Cleveland, Ohio, are introducing a board rule handle, as illustrated herewith. It is made of pure rubber and designed to slip over any board rule handle. It is claimed that this



Sure Grip Board Rule Handle.

handle obviates the slipping of the handle in the hands of lumbermen in wet and cold weather; and that it insures a light grip on the handle.

Alarmed by the cessation of her trade with Chili, Germany has dispatched a naval fleet to protect her interests.

The Government of Honduras has granted concessions to American citizens and others in aid of the prosecution of important public works, including two canals, telegraph line and railway. One of the canals, from the Caribbean Sea into the interior, will be navigable by ships.

It is said that Navarro's 10,000 water meters purchased by New York under the Tweed regime, and which cost the city over \$1,000,000, will soon be advertised for sale from the corporation yard as old junk.

Enterprise Barrel-Jack and Stand.

Enterprise Mfg. Company, Philadelphia, Pa., are introducing a barrel-jack and stand, as illustrated in Figs. 1 and 2. This consists of a truck, with wheels and rock-



Fig. 1.—Enterprise Barrel-Jack and Stand.

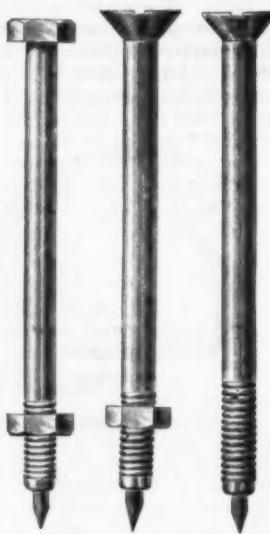
ers, and an attachment for tipping the barrel to any desired angle, to allow free drainage of the contents. The faucet is



Fig. 2.—Permanent Position of Barrel-Jack and Stand.

placed in the barrel, with the barrel standing on end. The nose pieces are placed under the chime of the barrel, the chain

screws and stove bolts, about 2½ inches in length, neatly finished in nickel plate. The lead is brought forward for use by



Bolt and Screw Pencils.

revolving the head of the bolt or screw; and they form unique as well as convenient vest pocket pencils.

First Shipment from the Upper Tennessee.

The first steamboat loaded with produce and manufactures passed through the Muscle Shoals on the Tennessee River last week, *en route* from Chattanooga to the Ohio River. By the completion of the Muscle Shoals Canal the entire upper Tennessee Valley is placed in direct water connection with the Ohio and Mississippi. The Tennessee is navigable from its mouth to the junction of the Holstein and French Broad rivers, four miles above Knoxville, a distance of 650 miles, during the greater portion of the year, except through the 23 miles obstructed by the Muscle Shoals, a canal through and around which has been constructed by the United States. Besides this long navigation in the main

"SURE GRIP"
BOARD RULE HANDLE
PATENT APPLIED FOR
THE LUFKIN RULE CO. CLEVELAND, O.

passed around the barrel and fastened to the handles, and the barrel is then rocked over until the wheels and handles rest on the floor. The jack is then wheeled to the place where it is to be kept. Its simplicity of construction and rapidity of execution are referred to, and the statement made that one man can operate it easily and do in a few seconds what usually occupies two men from 20 to 30 minutes. If a number of barrels are in a row, an empty one may be removed, and a full one put in its place without disturbing the other barrels. Each jack weighs, complete, 43 pounds.

Bolt and Screw Pencils.

Greenough, Hopkins & Cushing, 168 Devonshire street, Boston, are introducing novelties in pencils, as illustrated herewith. These are made to represent bolts,

river, smaller boats can ascend the French Broad 90 miles, the Hiawassee 43, and the Chinch 70, thus bringing some 200 additional miles of water route into immediate connection with the Mississippi and Ohio. The region traversed by these streams is rich in minerals and needed some cheap transportation route. The Tennessee River, now that it is open throughout its entire course, will afford a needed outlet and greatly aid in the development of the country, as well as benefit those cities, like New Orleans, St. Louis and Cincinnati, having direct water connection with it. The first loaded boat left Chattanooga, and, strange to say, *en route* to St. Louis, going down the Tennessee to the Ohio, down the Ohio to the Mississippi, and then up the Mississippi to St. Louis.

The Nebraska Maximum Freight Rate bill was killed by the Governor.

Improved Marking Gauge.

A. H. Goddard, Worcester, Mass., is introducing improved marking gauges, all illustrated in Figs. 1 and 2. The manufacturer claims that the gauge shown in Fig. 1 can be used for any and every kind of measurement required by woodworkers, machinists and workers of metal. The point is made that it will do circular and irregular work, both inside and outside,

The New Britton Rolling Mill.

Among the new works added in the past year to the many manufacturing establishments of Cleveland, one of the largest is the plant of the Britton Rolling Mill Company, which was started up last week. J. W. Britton, the founder, and formerly the president of the Britton Iron and Steel Company, sold his interest to John D. Rockefeller, and has withdrawn entirely

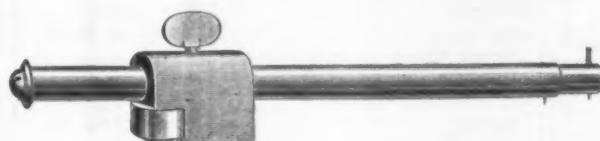


Fig. 1.—Improved Marking Gauge.

by the use of the roller guide. It has a milled-edge marking wheel, made of steel, which it is claimed will not follow the grain of the wood. The one thumb screw is designed to hold both tubes firmly in place. This gauge is referred to as being quickly and easily adjusted, and as expressly designed for durability and use-

from that company. Recognizing the advantages of Cleveland as an iron center, he decided to remain there, and purchased the past summer a tract of land excellently appointed for rolling mill purposes. The property consists of 11 acres, situated on the Lake Shore and Michigan Southern Railway, and having a frontage of 700 feet

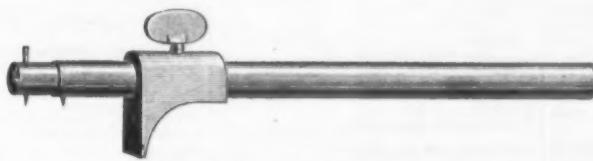


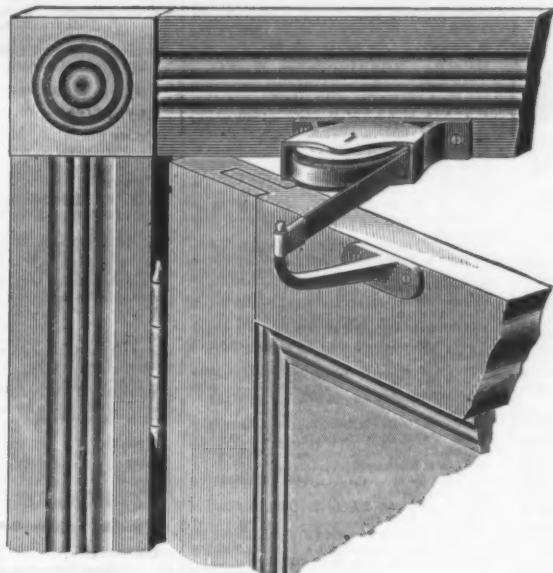
Fig. 2.—Improved Mortise Gauge.

fullness, and will doubtless be appreciated by mechanics and workers of metal. Fig. 2 represents a mortise gauge. These are made wholly of metal nickel-plated. It is stated that the material and make-up are first-class.

Pullman Door Spring.

Pullman Sash Balance Company, Rochester, N. Y., are introducing a door spring, as illustrated herewith. The manufacturers state that they use the finest grade clock spring steel, spring and bronze metal

on the railroad, running north 1000 feet to Lake Erie. Two switches, one on the east side and one through the center of the property, with the Pennsylvania Company's tracks only a few rods distant, give excellent receiving and shipping facilities. The first structure, which is now completed, is 160 feet long by 134 feet wide, and is covered entirely by iron. In this building are a three-high plate train and a sheet mill. The engine is a 32 x 60 inch Reynolds-Corliss built by the E. P. Allis Company of Milwaukee. There are three Hazleton tripod boilers of 175 horse-power each, one being placed over each o-



Pullman Door Spring.

tape. The spring is referred to as being simple, light, strong, complete, well made, and adapted for all classes of doors, and that it is easily applied. The point is made that it can be used on right or left hand doors, and always works free.

the three heating furnaces. The mill is equipped with the latest and most approved appliances in the way of shears, overhead tramways, &c., for the easy and rapid handling of material, and the entire floor is paved with fire brick. One of the

Britton patent leveling machines has been put in, as absolutely level sheets of every description will be made a specialty. The product of the mill will be plate and sheet steel for fire bed, gasometer, range and stove top, tank and deep stamping purposes, special attention being paid to soft sheet steel, rolled extra wide and long, pickled before finishing, and with great care taken as to exact gauges. It was the original intention of the company to go into the manufacture of tin plate and galvanized iron, but so many galvanizing plants have recently been established and the field is so well covered that tin plate will receive all their energy in that direction. Special buildings are shortly to be erected for tin plate purposes, and possibly in the future a steel works and a structural mill. The company already have a considerable part of the machinery needed for the tin plate department, so that it is not merely one of the things contemplated. The Britton Rolling Mill Company will be stocked for \$250,000. The officers of the company are as follows: J. W. Britton, president; F. W. Britton, vice-president; C. R. Britton, secretary; A. M. Britton, treasurer.

CONTENTS.

Engines for Cable Railway Power Stations. Illus.	675
Our Copper Resources.—II.	678
Providence Engines in Electric Railway Work.	679
Hydraulic Operating Screws for Blooming Mill. Illustrated.	680
Ramie Cultivation.	681
Lake Ore.	681
The Forter Hydraulic Ladle Crane. Illus.	682
The Calculation of Blast-Furnace Slags.—I.	684
Gang Slitting Machine. Illustrated.	686
The Columbia Iron and Steel Company.	686
The Great Forge at Cleveland.	687
Rigid Journal-Box Castings. Illustrated.	687
The Week.	687
Editorials:	
A Convention with Canada.	680
Construction of Boilers for Forced Draught.	689
Speculation in Brazil.	690
The Commonwealth of Australia.	691
Obituary.	691
Personal.	691
Rioting in the Coke Region.	691
Coal Product of the Far West.	692
A Low Pig Product.	693
Washington News.	693
Manufacturing: Iron and Steel, Machinery, Hardware, Miscellaneous.	694-695
Trade Report: Chicago, Philadelphia, Pittsburgh, Louisville, Cincinnati, Cleveland, Detroit, Financial, New York, St. Louis, Metal Market, British Iron and Metal Markets, Coal Market.	696-700-710
Hardware: Condition of Trade, Notes on Prices, Trade in the Northwest, Trade Items, Price-Lists, Circulars, &c., Louisville, It Is Reported—, Marking Prices, Warranting Edge Tools, Exports, Price Cards, French Porcelained Ware, Paints and Colors.	701-710
Real Bronze Lock No. 411. Illustrated.	711
Portable Automatic Cooling Fan. Illus.	711
Drive Stem Caster. Illustrated.	711
Nail Mill Tote Box. Illustrated.	711
Cream City Flue Stop. Illustrated.	711
Western States Commercial Congress.	711
Universal Lawn Keeper. Illustrated.	712
Sure Grip Board Rule Handle. Illustrated.	712
Enterprise Barrel-Jack and Stand. Illus.	712
Bolt and Screw Pencils. Illustrated.	712
First Shipment from the Upper Tennessee.	712
Improved Marking Gauge. Illustrated.	713
Pullman Door Spring. Illustrated.	713
The New Britton Rolling Mill.	713
Current Hardware Prices.	714-719
Current Metal Prices.	720

CURRENT HARDWARE PRICES.

APRIL 8, 1891.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.

Domestic, $\frac{1}{2}$ doz \$3.00, 33¢
Excelsior, $\frac{1}{2}$ doz \$10.00, 50¢
Washburn's Self-Locking, 20¢ \pm 10¢

Ammunition.

Caps, Percussion, 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's, 34¢
E. B. Trimmed Edge, 1-10's, 46¢
E. B. Grnd. Edge, Cent. Fire, 1-10's, 46¢
Musket Waterproof, 1-10's, 50¢
G. D., 28¢
S. B. Genuine Imported, 45¢
Eley's E. B., 54¢ \pm 57¢
Eley's D Waterproof, Central Fire, \$1.00

Cartridges

Arm Fire Cartridges, 50¢ \pm 2¢
Arm Fire Military, 15¢ \pm 2¢
Cent. Fire, Pistol and Rifle, 25¢ \pm 2¢
Cent. Fire, Military and Sporting, 15¢ \pm 2¢

Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.

Blank Cartridges, 22 cal., \$1.75, 2¢
Blank Cartridges, 32 cal., \$3.50, 2¢

Primed Shells and Bullets, 15¢ \pm 2¢

B. B. Caps, Round Ball, \$1.75, 2¢

B. B. Caps, Con. Ball, Swg'd, \$2.00, 2¢

Primers

Berdan Primers, \$1.00, 2¢
B. L. Caps (for Sturtevant Shells) \$1.00, 2¢

All other Primers, \$1.20, 2¢

Shells

First quality 4, 8, 10 and 12 gauge, 25¢ \pm 10¢ \pm 25¢

First quality, 14, 16 and 20 gauge, \$10 list, 30¢ \pm 10¢ \pm 25¢

Prixe, 40¢ \pm 25¢

Star, Club, Rival and Clirax brands, 33¢ \pm 10¢ \pm 25¢

Seibold's Comb. Shot Shells, 15¢ \pm 2¢

Brass Shot Shells, Club, Rival, Climax, 65¢ \pm 25¢

Shells Loaded

Standard List, July 19, 1890, 40¢ \pm 10¢

Wade—Price per M.

U. M. C. & W. R. A. B. E., 11 up, 68¢

U. M. C. & W. R. A. B. E., 9 & 10, 82¢

U. M. C. & W. R. A. B. E., 8, 96¢

U. M. C. & W. R. A. B. E., 7, \$1.10

U. M. C. & W. R. A. P. E., 11 up, 1.15

U. M. C. & W. R. A. P. E., 9 & 10, 1.50

U. M. C. & W. R. A. P. E., 8, 1.70

U. M. C. & W. R. A. P. E., 7, 1.80

Eley's B. E., 11 up, \$1.75

Eley's P. E., 11 up, 2.80

Anvils

Eagle Anvils, $\frac{1}{2}$ 10¢, 15¢ \pm 5¢

Peter Wright's, 11¢ \pm 14¢

Armitage's Mouse Hole, 10¢ \pm 11¢

Armitage's Mouse Hole, Extra, 12¢ \pm 12¢

Trenton, 10¢ \pm 10¢

Wilkinson's, 10¢ \pm 11¢

Moore & Barnes Mfg. Co., 33¢ \pm 25¢

Anvil Vice and Drill

Millers Falls Co., \$18.00, 20¢

Cheney Anvil and Vice, 25¢

Allen Anvil and Vice, \$3.00, 50¢ \pm 10¢

Star, 45¢ \pm 5¢

Apple Parers—See Parers, Apple, &c.

Augers and Bits

Douglas Mfg. Co., 70¢ \pm 10¢

Wm. A. Ives & Co., 70¢ \pm 10¢

Humphreys Mfg. Co., 70¢ \pm 10¢

French, Swift & Co. (F. H. Beecher, P. S. & W. Co.), 70¢ \pm 10¢

Rockford Bit Company, 70¢ \pm 10¢

Cook's, Douglas Mfg. Co., 55¢

Cook's, N. H. Copper Co., 50¢ \pm 10¢ \pm 15¢

Ives' Circular Lip, 60¢

Patent Solid Head, 30¢

C. E. Jennings & Co., No. 10, extension tip, 40¢

C. E. Jennings & Co., No. 30, 60¢

C. E. Jennings & Co., Auger Bits, 5 set, 32¢ \pm quarters, No. 5, \$5; No. 30, \$3.50, 20¢

Lewis' Patent Single Twister, 45¢

Russell Jennings' Augers and Bits, 25¢ \pm 10¢

Imitation Jennings' Bits, 40¢ \pm 10¢ \pm 5¢

Snell's Jennings Pattern, 60¢

Pugh's Black, 20¢

Rockford, Jennings' Pattern, 60¢

Car Bits, 60¢ \pm 10¢

Car Bits, P. S. & W. Co., 60¢ \pm 10¢

Snell's Car Bits, 60¢

L. Hommodieu Car Bits, 15¢ \pm 10¢

Forstner Pat. Auger Bits, 20¢

Cincinnati Bell-Hangers' Bits, 30¢ \pm 10¢

Bit Stock Drills

Morse Twist Drills, 50¢ \pm 10¢ \pm 5¢

Standard, 50¢ \pm 10¢ \pm 5¢

Cleveland, 50¢ \pm 10¢ \pm 5¢

Syracuse, for metal, 60¢ \pm 10¢

Syracuse, for wood (wood list), 90¢ \pm 10¢ \pm 5¢

Williams' or Holt's, for metal, 50¢ \pm 10¢ \pm 5¢

Williams' or Holt's, for wood, 40¢ \pm 10¢

Cincinnati, for wood, 30¢ \pm 10¢

Cincinnati, for metal, 35¢ \pm 10¢

Expansive Bits

Clark's small, \$18; large, \$26 \pm 35¢ \pm 5¢

Ives' No. 4, $\frac{1}{2}$ doz \$60, 40¢

Swan's, 40¢

Steer's, No. 1, \$26; No. 2, \$22, 35¢

Ives' No. 2, \$48, 20¢

Glacier Bits

Common, $\frac{1}{2}$ doz \$2.75 \pm 3.25

Diamond, $\frac{1}{2}$ doz \$1.10, 25¢ \pm 10¢

Bee, 25¢ \pm 25¢ \pm 5¢

Double Cut, Shepardson's, 15¢ \pm 4¢ \pm 10¢

Double Cut, Ct. Valley Mfg. Co., 30¢ \pm 10¢
Double Cut, Hartwell's, $\frac{1}{2}$ gro., 65¢
Double Cut, Douglass', 30¢ \pm 10¢
Double Cut, Ives', 60¢ \pm 60¢ \pm 10¢
Hollow Augers—

Ives', 33¢ \pm 10¢
French, Swift & Co., 33¢ \pm 10¢
Douglass', 33¢ \pm 10¢
Riley's Adjustable, $\frac{1}{2}$ doz \$48, 40¢ \pm 10¢
Stearns', 20¢ \pm 10¢
Ives' Expansive, each \$45, 50¢ \pm 5¢
Universal Expansive, each \$4.50, 20¢
Cincinnati Adjustable, 25¢ \pm 10¢
Cincinnati Standard, 25¢ \pm 10¢
Ship Augers and Bits—

L'Hommodieu's, 15¢ \pm 10¢ \pm 10¢ \pm 5¢
Watrous', 15¢ \pm 10¢ \pm 10¢ \pm 5¢
Snell's, 15¢ \pm 10¢ \pm 10¢ \pm 5¢
Snell's Ship Auger Patt'n Car Bits, 15¢ \pm 10¢ \pm 10¢ \pm 5¢

Awl Harts—See Harts, Awl.

Awls, Brad Sets, &c.

Awls, Sewing, Common, $\frac{1}{2}$ gr \$1.70, 35¢

Awls, Should. Peg, $\frac{1}{2}$ gr \$2.45, 40¢ \pm 10¢
Awls, Pat. Peg, $\frac{1}{2}$ gr \$3.60, 40¢ \pm 10¢
Awls, Shouldered Brad, 2.70 \pm gr, 35¢
Awls, Handled Brad, $\frac{1}{2}$ gr \$7.50 \pm gr, 45¢
Awls, Handled Scratch $\frac{1}{2}$ gr, \$7.35 \pm 10¢
Awls, Socket Scratch, $\frac{1}{2}$ gr, \$1.50 \pm 10¢
Awls, Sure Grip Steel, Tackl Blocks, 25¢

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—Plain, Beveled.

First quality, best brands, 87.00, 75¢ \pm 5¢
Second quality, 60.00, 65¢ \pm 5¢

Axe Treenase—See Grease, Axe.

Axes—

No. 1, 14¢ \pm 6¢, No. 2 25¢ \pm 6¢
Nos. 7 to 14, 55¢ \pm 6¢

Nos. 15 to 18, 47¢ \pm 5¢ \pm 3¢ cash

Nos. 19 to 22, 70¢ \pm 5¢

Concord Axes, loose collar, 56¢ \pm 6¢

Concord Axes, solid collar, 66¢ \pm 7¢

National Tubular Self-Oiling, 33¢ \pm 4¢ \pm 3¢ \pm 5¢

Bags—

Bag Holders—See Holders, Bag.

Balances—

Spring Balances, No. 2000, 20, 30

Chatillon, $\frac{1}{2}$ doz \$0.80, 0.95, 1.75 net

Chatillon Straight Balances, 40¢

Chatillon Circular Balances, 50¢ \pm 10¢

Bars—

Crow—

Cast Steel, $\frac{1}{2}$ in. \pm 3¢ \pm 6¢

Iron, Steel Points, $\frac{1}{2}$ in. \pm 3¢ \pm 6¢

Bases, Wash—

Standard Fibreware, No. 1, 10¢ \pm 1¢-inch, \$2;

12-inch, \$2.25; 13½-inch, \$2.75; 15-inch, \$3.25;

\$3.50.

Bearings—

Common, $\frac{1}{2}$ in. \pm 10¢ \pm 15¢

Empire, $\frac{1}{2}$ in. \pm 10¢ \pm 15¢

Keystone, $\frac{1}{2}$ in. \pm 10¢ \pm 15¢

Norway, $\frac{1}{2}$ in. \pm 10¢ \pm 15¢

American Screw Company, $\frac{1}{2}$ in. \pm 10¢ \pm 15¢

Norway, Phil., $\frac{1}{2}$ in. \pm 10¢ \pm 15¢

Port Chester Bolt and Nut Company, $\frac{1}{2}$ in. \pm 10¢ \pm 15¢

Empire, $\frac{1}{2}$ in. \pm 10¢ \pm 15¢

Keystone, Philadelphia, $\frac{1}{2}$ in. \pm 10¢ \pm 15¢

Norway, Phil., $\frac{1}{2}$ in. \pm 10¢ \pm 15¢

Port Chester, $\frac{1}{2}$ in. \pm 10¢ \pm

Chucks—

Beach Pat.	each, \$8.00	20%
Morse's Adjustable	each, \$7.00	20@25%
Danbury	each, \$6.00	30@35%
Syracuse, Bala Pat.	.....	25%
Graham Patent	.....	33@35
Skinner's Patent Chucks	.....	33@35
Combination Lathe Chucks	.....	33@35
Universal Lathe Chucks	.....	40%
Independent Lathe Chucks	.....	40%
Drill Chucks	.....	15%
Union Mfg. Co.	.....	10%
Victor	.....	8.50, 25%
Combination	.....	10%
Universal	.....	40%
Independent	.....	40%

Churns—

Tiffin Union, each, 5 gal.	\$3.25	7 gal.
\$3.75, 10 gal.	\$4.25	
McDermid Star Barrel Churn, each, 6 gal.	\$2.60	10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25.
Clamps—	.....

R. I. Tool Co.'s Wrought Iron	.....	25%
Adjustable, Cincinnati	.....	15@20%
Adjustable Hammers	.....	15%
Adjustable, Stearn's	.....	30@35@40%
Stearn's Adjustable Cabinet and Corner	.....	30@35@10%

Cabinet, Sergeant's	.....	60@80@10%
Carriage Makers' Sergeant's	.....	70@10%
Carriage Makers', P. S. & W. Co.	40@10%	
Eberhard Mfg. Co.	40@50@40@10%	
Warner's	40@10@40@10@25%	
Saw Clamps, see Vises. Saw Fliers'	.....
Carpenters', Cincinnati	.....	25@10%

Cleavers,	.....
Butchers'	.....
Bradley's	.....	25@30%
L. & I. J. White	.....	20@25%
Beatty's	.....	40@40@5%
New Haven Edge Tool Co.'s	.....	40%
P. S. & W.	33@40@33@40@10%	
Foster Bros.	.....	30%
Schulte, Lenhoff & Co.	.....	40@40@5%

Clips—	.....
Norway, Axle, 1/2 & 5-16	55@5@5%	
2nd grade Norway Axle, 1/2 & 5-16	65@5@5%	
Superior Axle Clips	60@5@270%	
Norway Spring Bar Axle Clips, 5-16	50@5@5%	
Wrought-Iron Felloe Clips	70@5@5%	
Steel Felloe Clips	70@5@5%	
Baker Axle Clips	25%	

Cloth and Netting, Wire—See	Wire, &c.	
Wire, &c.	.....	50%
Cocks, Brass	.....
Hardware list	.....	50@25%
Coffee Mills—See Mills, Coffee.	.....
Collars, Dog, &c.	.....
Medford Fancy Goods Co.	40@10%	
Embossed, Gilt, Pope & Steven's list	30@10%	
Leather, Pope & Steven's list	40%	
Brass, Pope & Steven's list	40%	
Chapman Mfg. Company	50@10@60%	

Combs, Curry.	.....
Fitch's	50@10@50@10@10%	
Rubber, per doz \$10.00	20%	
Perfect	50%	

Compasses, Dividers, &c.—	.....
Compasses, Callipers, Dividers	70@70@10%	
Bemis & Call Co.'s	.....
Dividers	60@5@5%	
Compasses & Callipers	50@5@5%	
Wing and Inside or Outside	50@5@5%	
Double	60%	
(Call's Pat. Inside)	30%	
Excelsior	50%	
J. Stevens & Co.'s	25@10%	
Starrett's	.....
Spring Callipers and Dividers	25@10%	
Lock Callipers and Dividers	25%	
Combination Dividers	25%	

Coopers' Tools—See Tools, Coopers'.	.....
Cord—	.....
Sash.	.....
Common	70@10@11@	
Patent, good quality	70@13@15@	
White Cotton Braided, fair	70@25@37@	
Common Russia Sash	70@13@	
Patent	70@15@	
Cable Laid Italian Sash	70@22@23@	
Indian Cable Laid	70@13@	
Silver Lake—	.....
A Quality, White, 50%	10@10@5%	
A Quality, Drab, 50%	10@10@5%	
B Quality, White, 50%	28@27@5%	
B Quality, Drab, 50%	31@33@5%	
C Quality, White, 50%	26@27@5%	
Sylvan Spring, Extra Braided, White	24@	
Sylvan Spring, Extra Braided, Drab	24@	
Seemper Item, Braided, White	30@	
New Process	50@10@5%	
Graham's Pat. Groove Shank	50@10@5%	
Egyptian, India Hemp, Braided	25%	

Baum's	.....
Braided, White Cotton, 50%	20@30@5%	
Braided, Drab Cotton, 50%	20@30@5%	
Braided, Italian Hemp, 50%	20@30@5%	
Braided, Linen 80%	30@30@5%	
Fate & Co. Braided Wire, 100 ft.	50@	
Wire Picture.	.....
Braided or Twisted	75@10%	

Corkscrews—See Screws, Cork.	.....
Corn Knives and Cutters—See	Knives, Corn.	
Crackers, Nut—	.....
Table (H. & B. Mfg. Co.)	40%	
Blake's Pattern	70@20, 10%	
Turner & Seymour Mfg. Co.	50%	

Cradles—	.....
Grain	50@5@2@50@10@25	
Crayons.	.....
White Crayons, 12@12@4@	10%	
D. M. Stewart Mfg. Co., Metal Workers	70@	
50@		
D. M. Stewart Mfg. Co., Rolling Mill	70@	
50@		
50@25@		
See also Chalk.	.....
Crow Bars—See Bars, Crow.	.....
Curry Combs—See Combs, Curry.	.....
Curtain Pins—See Pins, Curtain	.....

Cutters—

Meat.	.....
Dixon's Pat. dos	.....	40@25%
Nos. 1	2	3
Nos. 12	11	10
Nos. 13	12	11
Nos. 14	13	12
Nos. 15	14	13
Nos. 16	15	14
Nos. 17	16	15
Nos. 18	17	16
Nos. 19	18	17
Nos. 20	19	18
Nos. 21	20	19
Nos. 22	21	20
Nos. 23	22	21
Nos. 24	23	22
Nos. 25	24	23
Nos. 26	25	24
Nos. 27	26	25
Nos. 28	27	26
Nos. 29	28	27
Nos. 30	29	28
Nos. 31	30	29
Nos. 32	31	30
Nos. 33	32	31
Nos. 34	33	32
Nos. 35	34	33
Nos. 36	35	34
Nos. 37	36	35
Nos. 38	37	36
Nos. 39	38	37
Nos. 40	39	38
Nos. 41	40	39
Nos. 42	41	40
Nos. 43	42	41
Nos. 44	43	42
Nos. 45	44	43
Nos. 46	45	44
Nos. 47	46	45
Nos. 48	47	46
Nos. 49	48	47
Nos. 50	49	48
Nos. 51	50	49
Nos. 52	51	50
Nos. 53	52	51
Nos. 54	53	52
Nos. 55	54	53
Nos. 56	55	54
Nos. 57	56	55
Nos. 58	57	56
Nos. 59	58	57
Nos. 60	59	58
Nos. 61	60	59
Nos. 62	61	60
Nos. 63	62	61
Nos. 64	63	62
Nos. 65	64	63
Nos. 66	65	64
Nos. 67	66	65
Nos. 68	67	66
Nos. 69	68	67
Nos. 70	69	68
Nos. 71	70	69
Nos. 72	71	70
Nos. 73	72	71
Nos. 74	73	72
Nos. 75	74	73
Nos. 76	75	74
Nos. 77	76	75
Nos. 78	77	76
Nos. 79	78	77
Nos. 80	79	78
Nos. 81	80	79
Nos. 82	81	80
Nos. 83	82	81
Nos. 84	83	82
Nos. 85	84	83
Nos. 86	85	84
Nos. 87	86	85
Nos. 88	87	86
Nos. 89	88	87
Nos. 90	89	88
Nos. 91	90	89
Nos. 92	91	90
Nos. 93	92	91
Nos. 94	93	92
Nos. 95	94	93
Nos. 96	95	94
Nos. 97	96	95
Nos. 98	97	96
Nos. 99	98	97
Nos. 100	99	98
Nos. 101	100	99
Nos. 102	101	100
Nos. 103	102	101
Nos. 104	103	102
Nos. 105	104	103
Nos. 106	105	104
Nos. 107	106	105
Nos. 108	107	106
Nos. 109	108	107
Nos. 110	109	108
Nos. 111	110	109
Nos. 112	111	110
Nos. 113	112	111
Nos. 114	113	112
Nos. 115	114	113
Nos. 116	115	114
Nos. 117	116	115
Nos. 118	117	116

Roggins' Latches. \$ per doz 30¢ & 35¢
Bronze Iron Drop Latches. \$ per doz 7¢ net
Jap'd Store Door Handles—Nuts, \$1.62;
Plate, \$1.10; no Plate, \$0.88 net
Barn Door, \$ per doz \$1.40 10¢ & 10¢
Chest and Lifting. 70¢

Wood—

Saw and Plane. 40¢ & 10¢ & 10¢ & 5¢
Hammer, Hatchet, Axe, Sledge, &c. 40¢
Brad Awl. \$ per gr \$2.00
Hickory Firmer Chisel, ass'd. \$ per gr 4.50
Apple Firmer Chisel, ass'd. \$ per gr 5.00
Apple Firmer Chisel, large. \$ per gr 6.00
Sacket Firmer Chisel, ass'd. \$ per gr 8.00
Sacket Framing Chisel, ass'd. \$ per gr 5.00
J. S. Smith & Co.'s Pat. File. 50¢
File, assorted. \$ per gr 2.75
Auger, assorted. \$ per gr 5.00 50¢
Auger, large. \$ per gr 7.00 50¢
Pat. Auger, "res". \$ per gr 10¢
Pat. Auger, Douglass. \$ per set 1.25
Pat. Auger, Swan's. \$ per set 1.00
Hoe, Rake, Shovel, &c. \$ per doz 10¢

Hangers—

Barn Door, old patterns. 60¢ & 10¢ & 10¢ & 70¢
Barn Door, New England. 60¢ & 10¢ & 10¢ & 70¢
Samson Steel Anti-Friction. 55¢
Mleans Steel. 55¢
Hamilton Wrought Wood Track. 55¢
E. S. Wood Track. 55¢
Champion. 60¢ & 10¢
Rider and Wooster, Medina Mfg. Co.'s
Hat. 70¢
Climax Anti-Friction. 55¢
Climax Anti-Friction for Wood Track. 55¢
Zenith for Wood Track. 55¢
Reed's Steel Arm. 50¢
Challenge Barn Door. 50¢
Sterling. 50¢ & 50¢ & 10¢
Victor, No. 1, \$15.00; No. 2, \$16.50; No.
\$18.00. 50¢ & 25¢
Cheritree. 50¢ & 10¢
Kidder's. 50¢ & 10¢ & 60¢
The Boss. 50¢ & 10¢
Best Anti-Friction. 50¢ & 10¢
Duplex (Wood Track). 60¢ & 10¢ & 55¢
Terry's Pat. \$ per doz pr. 4 in. \$10.00; 5 in.
\$12.00. 50¢ & 10¢
Terry's Steel Anti-Friction Leader. 50¢ & 10¢
Terry's Steel Anti-Friction Ideal. 50¢ & 10¢
Cronk's Patent, Steel Covered. 50¢ & 55¢
Wood Track Iron Clad. \$ per ft. 10¢ 50¢
Carrier Steel Anti-Friction. 50¢ & 10¢
Architect, \$ per set \$6.00. 20¢
Eclips. 20¢ & 10¢
Felix. \$ per \$4.50. 20¢
Richards'. 50¢ & 50¢ & 10¢
Lane's Standard. 50¢ & 50¢ & 10¢
Lane's New Standard. 50¢ & 50¢ & 10¢
Ball Bearing Door Hanger. 20¢ & 10¢ & 25¢ & 210¢
Warner's Pat. 20¢ & 10¢ & 20¢ & 10¢ & 210¢
Stearns' Anti-Friction. 20¢ & 10¢ & 20¢ & 10¢ & 210¢
Stearns' Challenge. 25¢ & 10¢ & 25¢ & 210¢ & 210¢
Faultless. 40¢ & 40¢ & 55¢
American, \$ per set \$6.00. 20¢ & 10¢
Rider & Wooster, No. 1, 62¢ & 10¢; No. 2,
75¢. 40¢
Paragon, Nos. 1, 2 and 3. 40¢ & 10¢
Cincinnati. 25¢ & 10¢
Paragon, Nos. 5, 5 1/2, 7 and 8. 20¢ & 10¢
Crescent. 60¢ & 60¢ & 10¢
Nickel Cast Iron. 50¢
Nickel, Malleable Iron and Steel. 40¢
Scranton Anti-Friction Single Strap. 55¢
Wild West, 4 in. Wheel, \$15.00; 5 in.
Wheel, \$21.00. 45¢
Star. 40¢ & 10¢ & 20¢ & 55¢
May. 50¢ & 50¢ & 10¢
Barry, 26.00. 40¢ & 10¢
Interstate. 50¢
Magic. 45¢

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.
Blood's.
Hunt's.
Hurd's.
Mann's.
Peck's.
Underhill's. 40 & 10
Buffalo Hammer Co. @
Fayette R. Plumb. 50 & 55¢
C. Hammond & Son
Kelly's.
Sargent & Co.
P., S. & W. Co.
Ten Eyck Edge Tool Co.
Collins. 10¢
Schulte, Lohoff & Co. 50¢ & 50¢ & 55¢

Hay and Straw Knives—See Knives.**Hinges—**

Blind Hinges—
Parker. 75¢ & 25¢
Palmer. 50¢ & 55¢ & 10¢
Seymour. 70¢ & 25¢
Huffer. 50¢
Clark's, Nos. 1, 3, 5, 40 and 50.
75¢ & 10¢ & 5¢ & 80¢
Clark's Mortise Gravity. 50¢
Sargent's, Nos. 1, 3, 5, 11, 13.
75¢ & 10¢ & 55¢ & 10¢ & 55¢
Sargent's, No. 12. 75¢ & 10¢ & 70¢ & 10¢
Reading's Gravity. 75¢ & 10¢ & 75¢ & 10¢ & 80¢
Sheard's
Noiseless. 75¢ & 10¢
Niagara. 80¢
Buffalo. 80¢
Clark's Genuine Pattern. 80¢
O. S., Lull & Porter. 75 & 10¢
Acme, Lull & Porter. 75¢
Queen City Reversible. 70¢ & 10¢ & 75¢
O. S., Lull & Porter, Nos. 1, 1, 13,
2, 2 1/2, 3. 75¢ & 10¢ & 25¢
Artis' Automatic Blind Fixtures, No.
2, for Wood, \$9.00; No. 3, for Brick,
\$11.00. 10¢

Gate Hinges—

Western. \$ per doz \$4.40, 60¢
N. E. \$ per doz \$7.00, 55¢
N. E. Reversible. \$ per doz \$5.20, 55¢ & 10¢
Clark's, Nos. 1, 2, 3. 60¢ & 10¢ & 55¢
N. Y. State. \$ per doz \$5.00, 55¢ & 10¢
Automatic. \$ per doz \$12.50, 50¢
Common Sense. \$ per doz pair \$4.50, 50¢
Seymour's. 45¢ & 10¢
Sheard's. 60¢ & 10¢ & 55¢
Reed's Latch and Hinges. \$ per doz \$12.00,
50¢

Spring Hinges—

Union Spring and Blank Butts. 40¢
Four's Spring Hinge Co.'s list, March
1886. 20¢

Acme. 30¢
J. S. 25¢ & 10¢
Empire and Crown. 55¢
Hero and Monarch. 55¢
American, Gem, and Star. 20¢
Oxford. 25¢
Burke's Double Acting. 25¢
Union Mfg. Co. 25¢
Bommer's. 20¢
Suckman's. 15¢ & 20¢
Chicago. 30¢
Wiles'. 10¢
Devore's. 40¢
Rex. 60¢
Royal. 60¢
Reliable. 60¢
Champion. 60¢
Bardsley's Patent. 40¢
Stearn's. 50¢ & 10¢
Niagara, Holdback pattern, per
gross. \$14.00

Wrought Iron Hinges

List February 14, 1891.
List and T. 50¢ & 10¢
Corrugated Strap and T. 50¢ & 10¢
Screw Hook and T. 6 to 12 in. \$ per doz 4¢
Strap. 14 to 20 in. \$ per doz 5¢ & 55¢
Screw Hook and Eye. 16 in. \$ per doz 75¢
Strap. 22 to 36 in. \$ per doz 3¢

Rolled Blind Hinges, Nos. 82 and 84.

Rolled Blind Hinges, Nos. 232 and 234. 50¢ & 10¢

Rolled Plate. 70¢ & 10¢

Rolled Raised. 70¢ & 10¢

Plate Hinges { 8, 10 & 12 in. \$ per doz 5¢

"Providence" { over 12 in. \$ per doz 4¢

Hoes—**Eye—**

D. & H. Scovil. 20¢
Lane's Crescent Planters Pattern. 45¢ & 5¢
Lane's Razor Blade, Scovil Pattern. 30¢

Maynard, S. & O. Pat. 45¢ & 5¢

Sandusky Tool Co., S. & O. Pat. 50 & 10¢

Am. Axe and Tool Co., S. & O. 60¢

Pat. 60¢ & 10¢

Chattanooga Tool Co., S. & O. Pat. 60¢

Grub. 60¢ & 10¢

Handled—

Garden, Mortar, &c. 65¢ & 65¢ & 10¢

Planter's, Cotton &c. 65¢ & 65¢ & 10¢

Warren Hoe. 60¢

Magic. \$ per doz \$4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders—**Bag—**

Sprengle's Pat. \$ per doz \$18. 60¢

Bit—

Extension. 40¢ & 10¢ & 10¢

Barber's. \$ per doz \$15.00. 40¢ & 10¢ & 10¢

Ives, \$ per doz \$20.00. 60¢ & 60¢ & 10¢

Diagonal. \$ per doz \$24.00, 40¢

Angular. \$ per doz \$24.00, 40¢ & 5¢

File and Tool—

Bals Pat. \$ per doz \$4.00; 25¢

Nicholson File Holders. 20¢

Dick's Tool Holder. 20¢

Hooks—**Cast Iron—**

Bird Cage, Sargent's list.

Bird Cage, Reading. 60¢ & 10¢ & 10¢

Clothes Line, Sargent's list.

Clothes Line, Reading list. 60¢ & 10¢ & 10¢

Ceiling Sargent's list. 55¢ & 10¢ & 10¢

Harness, Reading list. 55¢ & 10¢ & 55¢ & 10¢

Coat and Hat, Sargent's list. 55¢ & 10¢ & 60¢ & 10¢ & 10¢

Coat and Hat, Reading. 50¢ & 10¢ & 50¢ & 10¢

Wrought Iron—

Wire Coat and Hat, Gem, list April, 1886. 60¢

Wire Coat and Hat, Miles', list April, 1886. 50¢

Indestructible Coat and Hat. 45¢

Wire Coat and Hat, Standard. 60¢

Handy Hat and Coat. 50¢ & 10¢

Steady Ceiling Hooks. 50¢ & 10¢

Belt. 80¢ & 80¢ & 10¢

Atlas, Coat and Hat. 60¢

Miscellaneous.

Wire Coat and Hat, Gem, list April, 1886. 60¢

Wire Coat and Hat, Miles', list April, 1886. 50¢

Bench Hooks. See Bench Stops

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition. 75¢ & 75¢

Standard. 60¢ & 10¢ & 5¢ & 10¢ & 10¢

Extra. 60¢ & 10¢ & 6¢

N. Y. B. & P. Co., Para. 25¢ & 5¢

N. Y. B. & P. Co., Extra. 40¢ & 8¢ & 5¢

N. Y. B. & P. Co., Dundee. 40¢ & 10¢ & 6¢

Huskers—

Bairl's Adjustable. \$ per gr \$8.00

Bairl's Adjustable Clipper. \$ per gr 7.00

Hubbard's Solid Steel. \$ per gr 4.50

Peck, Stow & W. Co. 60¢ & 10¢

Indurated Fiber-Ware—See Ware, Indurated Fiber.

Irons—**Sad—**

From 4 to 10, at factory. \$ per doz 100¢

Reiher's, list Feb. 20, 1891. \$ per doz 120¢

Self-Heating. \$ per doz \$9.00 net

Self-Heating, Tailors'. \$ per doz \$18.00 net

Mrs. Pott's Irons. 50¢ & 55¢

Enterprise Star Irons. 50¢ & 55¢

XX Cold Handle Sad Irons. 50¢ & 55¢

Ideals Irons new list 50¢ & 10¢ & 10¢

Salamander, Irons. 25¢

Combined Fluter and Sad Iron, \$ per doz

Fox Reversible, Self-Fluter \$ per doz 25¢

China Laundry (N. E. Butt Co.) \$ per doz 15¢

New England. 15¢

Mahonia's Trade Pat. Irons. 25¢

Sensible, Inc. Jan. 91. 50¢ & 10¢ & 5¢

National Self-Heating. 35¢

Soldering.

Soldering Copper. \$ per doz 22¢ & 23¢

Covert's Adjustable, list Jan. 1, 1886. 35¢ & 25¢

Irons, Pinking, per doz. 65¢

Jack Screws—See Screws.

Jacks, Wagon.

Daisy. 33¢ & 35¢

Victor. 33¢ & 35¢

Kettles—

Brass, Spun, Plain, list Jan. 1, '91. 55¢ & 55¢

Brass, Spun, Pltd. W. M. list Jan. 1, '91. 55¢

Enamelled and Tea—See Hollow Ware.

Keys—

Lock Asso's list Dec. 30, 1886. 50¢ & 10¢

Deitz, Nos. 36 to 39. 40¢

Deitz, Nos. 51 to 63. 40¢ & 10¢

Deitz, Nos. 86 to 96. 30¢

Stoddard Lock Co. 30¢ & 33¢ & 35¢

Shepard Hand Fluter. No. 110 $\frac{1}{2}$ doz \$1.00.....	10%	World's Best. $\frac{1}{2}$ gross, No. 1, \$12.00.....	Pumps.
Shepard Hand Fluter. No. 95 $\frac{1}{2}$ doz \$8.00.....	40%	No. 2, \$24.00; No. 3, \$36.00.....	Cistern, Best Makers. ... 60@60@10%
Clark's Hand Fluter. $\frac{1}{2}$ doz \$15.00.....	35%	Universal, $\frac{1}{2}$ doz \$3.00.....	Pitcher Spout, Best Makers. ... 67@70%
Combined Fluter and Sod Iron. $\frac{1}{2}$ doz \$15.00.....	30%	Champion, $\frac{1}{2}$ doz \$2.00.....	Pitcher Spout, Cheaper Goods. 70@70@55
Buffalo $\frac{1}{2}$ doz \$10.00.....	10%	Punches.	
Hoisting—		Steadiers' or Drive, good. $\frac{1}{2}$ doz ... 60@65	
Moore's Hand Hoist, with Lock		Bemis & Call Co.'s Cast Steel Drive. 50@55	
Brake. 20%		Spring. good quality. $\frac{1}{2}$ doz 12.50@2.00	
Moore's Differential Pulley Block. 40%		Leach's Pat. 15%	
Energy Mfg. Co.'s. 25%		Bemis & Call Co.'s Spring and Check. 40%	
Surge Grip Steel Tackle Blocks. 25%		Solid Tinner's P.S. & W. Co. #doz 1.44, 55%	
Washing—		Tin'm' Hollow Punches P.S. & W. Co. 20@25	
Anthony Wayne, $\frac{1}{2}$ doz No. 1, \$51; No. 2, \$15; No. 3, \$42.		Rice Hand Punches. 15%	
Mallets.		Avery's Revolving. 40%	
Hickory. 30@10@20@10@10%		Avery's Saw-Set and Punch. See Saw Sets.	
Lignumvitae. 30@10@20@10@10%			
B. & L. Block Co., Hickory & L. V. 30@30@10%			
Mattocks. Regular list. 60@10@60@10@5%			
Measures—			
Standard Fiberware, No. 1, peck, $\frac{1}{2}$ dozen, \$4; $\frac{1}{2}$ peck, \$8.50.			
Meat Cutters— See Cutters, Meat.			
Mills.			
Coffee—			
Box and Side, List Jan. 1, 1888. 60@25			
American, Enterprise Mfg. Co. 20@10@20@10@20			
The Swift, Lane Bros. 20@20			
Mincing Knives — See Knives, Mincing.			
Molasses Gates — See Gates, Molasses.			
Money Drawers — See Drawers, Money.			
Mowers, Lawn.			
Pennsylvania, New Model, Excelsior, Continental, &c. 60@60@5%			
Philadelphia. 60@60@5%			
Other Machines. 60@10@5@70%			
Muzzles—			
Safety. $\frac{1}{2}$ doz, \$3.00, 25 g.			
Nails.			
Cut and Wire. See Trade Report.			
Wire Nails, Papered.			
Association List, July 15, '89. 75@10%			
Tack Mfrs.' List. 70%			
Wire Nails, Standard Penny.			
Card June 1, '89, base. \$2.35 @ \$2.50			
Horse. Nos. 6 7 8 9 10			
Ausable. 28@26@25@24@23@ 40@5@2%			
Clinton, Fin. 19@17@16@15@14@ 30@			
Essex. 28@26@25@24@23@ 25@25@5%			
Lyr. 19@17@16@15@14@ 30@			
Snowden. 19@17@16@15@14@ 30@			
Putnam. 23@21@20@19@18@ 1000 $\frac{1}{2}$ in. in year 15%			
Vulcan. 23@21@20@19@18@12@45@ 25@25@5%			
Northwest'n. 23@22@21@20@ 25@25@5%			
Globe. 23@21@20@19@18@ 20@5@5%			
Boston. 23@21@20@19@18@ 20@5@5%			
A. C. 23@23@22@21@21@ 25@10@33@4@5@			
C. B.-K. 23@23@22@21@21@ 25@10@33@4@5@			
Maud S. 25@23@22@21@21@ 40@10@ 40@10@ 10@ 10@			
Champlain. 23@21@20@19@23@ 25@10@10@ 10@			
New Haven. 28@25@24@23@ 25@10@25@10@10@ 10@			
Saranac. 23@21@20@19@18@ 30@10@ 10@10@ 10@			
Champion. 25@23@22@21@20@ 10@10@10@ 10@			
Capewell. 28@26@5@24@23@ 25@10@10@ 10@			
Star. 23@21@19@18@ 10@10@10@ 10@			
Anchor. 23@21@20@19@18@ 35@			
Western. 23@21@20@19@18@ 40@10@ 10@			
Empire Bronzed. 14@ 2			
Picture—			
Brass Head, Sargent's List. 50@10@10@ 10@			
Brass Head, Combination List. 50@10@ 10@			
Porcelain Head, Sargent's List. 50@10@10@ 10@			
Porcelain Head, Combination List. 40@10@ 10@			
Niles' Patent. 40@			
Nail Pullers. — See Pullers, Nail.			
Nail Sets. — See Sets, Nail.			
Nut Crackers. — See Crackers, Nut.			
Nuts. — List Dec. 18, 1889.			
Square. Hex.			
Hot Pressed. 5.40@ 6.00@ off list.			
Cold Punched. 5.00@ 5.10@ off list.			
In packages of 100 $\frac{1}{2}$, add 1-10@ $\frac{1}{2}$ doz net; in packages less than 100 $\frac{1}{2}$, add 1@ $\frac{1}{2}$ doz net.			
Oakum—			
Best. $\frac{1}{2}$ doz 71@71@ 71@			
U. S. Navy. $\frac{1}{2}$ doz 6@6@6@6@			
Navy. $\frac{1}{2}$ doz 6@6@6@6@			
Oilers—			
Zinc and Tin. 65@10@70%			
Brass and Copper. 50@10@50@10@5%			
Malleable, Hammers' Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40 $\frac{1}{2}$ doz. 10@10@5%			
Malleable, Hammers, Old Pattern, same list. 40%			
Prior's Pat. or "Paragon" Zinc. 60@10@10@			
Prior's Pat. or "Paragon" Brass. 50%			
Malice, Hammers' Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40 $\frac{1}{2}$ doz. 10@10@5%			
Malice, Hammers, Old Pattern, same list. 40%			
Paints—			
Beckley, Beckley & Co.'s. 60@10@			
Sargent & Co.'s. 31@ and 31@. 60@10@			
Feck, Stow & W Co. 50@10@50@10@5@			
Curtain—			
Silvered Glass. net			
White Enamel. net			
Ecufaneon, Iron, list Nov. 11, 1885. 50@10@50@10@5@			
Brass. 60@60@5@			
Pipe, Wrought Iron—			
List September 18, 1889.			
1/4 and under, Plain. 57@5@			
1/4 and under, Galvanized. 50%			
1/4 and over, Plain. 67@5@			
1/4 and over, Galvanized. 50%			
Boiler Tubes. 50%			
2 1/4 in. and smaller. 50%			
Larger than 2 1/4. 60%			
Planes and Plane Irons—			
Wood Planes—			
Molding. 35@2@			
Bench, First Quality. 50@2@			
Bench, Second Quality. 55@2@			
Bailey's (Stanley R. & L. Co.). 40@10@			
Pump—			
Bailey's (Stanley R. & L. Co.). 40@10@40@10@10@			
Miscellaneous Planes (Stanley R. & L. Co.). 20@10@20@10@10@			
Victor Planes (Stanley R. & L. Co.). 20@10@20@10@10@			
Punches—			
Saddlers' or Drive, good. $\frac{1}{2}$ doz. 60@65			
Bemis & Call Co.'s Cast Steel Drive. 50@55			
Bemis & Call Co.'s Springfield Socket. 50@55			
Spring, good quality. $\frac{1}{2}$ doz 12.50@2.00			
Spring, Leach's Pat. 15%			
Bemis & Call Co.'s Spring and Check. 40%			
Solid Tinner's P.S. & W. Co. #doz 1.44, 55%			
Tin'm' Hollow Punches P.S. & W. Co. 20@25			
Rice Hand Punches. 15%			
Avery's Revolving. 40%			
Avery's Saw-Set and Punch. See Saw Sets.			
Rail—			
Sliding Door, Wr't Brass. $\frac{1}{2}$ in. 35@. 15%			
Sliding Door, Bronzed Wr't Iron. $\frac{1}{2}$ in. 70@. 70@			
Sliding Door, Iron, Painted, $\frac{1}{2}$ foot 4@. 40@			
Barn Door, Light. In. 35@. 35@			
Per 100 feet. 32.00 2.50 3.10, 10%			
B. D. for N. E. Hangers—			
Small, Med. Large.			
Per 100 feet. 32.15 2.70 3.35, net			
Terry's Steel Rail, $\frac{1}{2}$ foot. 41@			
Victor Track Rail, $\frac{1}{2}$ foot. 50@2@			
Carrier Steel Rail, $\frac{1}{2}$ foot. 41@			
Moore's Wrought Iron. 30@			
Rakes—			
Cast Steel, Association goods. 66@60@10%			
Cast Steel, outside goods. 60@10@10@70@5%			
Rails—			
Sliding Door, Wr't Brass. $\frac{1}{2}$ in. 35@. 15%			
Sliding Door, Bronzed Wr't Iron. $\frac{1}{2}$ in. 70@. 70@			
Sliding Door, Iron, Painted, $\frac{1}{2}$ foot 4@. 40@			
Barn Door, Light. In. 35@. 35@			
Per 100 feet. 32.00 2.50 3.10, 10%			
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Carrier Steel Rail, $\frac{1}{2}$ foot. 41@			
Moore's Wrought Iron. 30@			
Rakes.			
Cast Steel, Association goods. 66@60@10%			
Cast Steel, outside goods. 60@10@10@70@5%			
Rails.			
Sliding Door, Wr't Brass. $\frac{1}{2}$ in. 35@. 15%			
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Rails.			
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Carrier Steel Rail, $\frac{1}{2}$ foot. 41@			
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Rakes.			
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Cast Steel, outside goods. 60@10@10@70@5%			
Rails.			
Sliding Door, Wr't Brass. $\frac{1}{2}$ in. 35@. 15%			
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Sliding Door, Iron, Painted, $\frac{1}{2}$ foot 4@. 40@			
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Per 100 feet. 32.00 2.50 3.10, 10%			
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Small, Med. Large.			
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Terry's Steel Rail, $\frac{1}{2}$ foot. 41@			
Victor Track Rail, $\frac{1}{2}$ foot. 50@2@			
Carrier Steel Rail, $\frac{1}{2}$ foot. 41@			
Moore's Wrought Iron. 30@			
Rakes.			
Cast Steel, Association goods. 66@60@10%			
Cast Steel, outside goods. 60@10@10@70@5%			
Rails.			
Sliding Door, Wr't Brass. $\frac{1}{2}$ in. 35@. 15%			
Sliding Door, Bronzed Wr't Iron. $\frac{1}{2}$ in. 70@. 70@			
Sliding Door, Iron, Painted, $\frac{1}{2}$ foot 4@. 40@			
Barn Door, Light. In. 35@. 35@			
Per 100 feet. 32.00 2.50 3.10, 10%			
B. D. for N. E. Hangers—			
Small, Med. Large.			
Per 100 feet. 32.15 2.70 3.35, net			
Terry's Steel Rail, $\frac{1}{2}$ foot. 41@			
Victor Track Rail, $\frac{1}{2}$ foot. 50@2@			
Carrier Steel Rail, $\frac{1}{2}$ foot. 41@			
Moore's Wrought Iron. 30@			
Rakes.			
Cast Steel, Association goods. 66@60@10%			
Cast Steel, outside goods. 60@10@10@70@5%			
Rails.			
Sliding Door, Wr't Brass. $\frac{1}{2}$ in. 35@. 15%			
Sliding Door, Bronzed Wr't Iron. $\frac{1}{2}$ in. 70@. 70@			
Sliding Door, Iron, Painted, $\frac{1}{2}$ foot 4@. 40@			
Barn Door, Light. In. 35@. 35@			
Per 100 feet. 32.00 2.50 3.10, 10%			

Atkins' Circular Shingle and Heading Hammer, 10¢	Hammer, Hotchkiss, \$5.50, 10¢	Smith's Adjustable Milk Strainer, \$2.00	Fence Staples, Galvanized, \$1.25
Atkins' Silver Steel Diamond X Cuts # foot 70¢	Hammer, Bemis & Call Co.'s New Pat., 30¢ & 50¢	Smith's Adjustable T. & C. Strainer, \$2.00	Fence Staples, Plain, \$1.25
Atkins' Special Steel Dexter X Cuts # foot 50¢	Hammer, Bemis & Call Co.'s Lever and Spring, 30¢ & 50¢	Steves, Wooden Rim, Iron, Plated, \$1.00	Same price as B'rb'Wire.
Atkins' Special Steel Diamond X Cuts # foot 32¢	Hammer, Bemis & Call Co.'s Plate, 10¢	Mesh 18, Nested, \$1.00	Fence Staples, Plain, \$1.25
Atkins' Champion and Electric Tooth X Cuts, # foot 30¢	Aiken's Genuine, \$13.00, 50¢ & 10¢	Mesh 20, Nested, \$1.10	See Trd. Rep.
Atkins' Hollow Back X Cuts, # foot 20¢	Aiken's Imitation, \$7.00, 55¢ & 51¢	Mesh 24, Nested, \$1.25	Steelyards, 40¢ to 50¢
Atkins' Mulay, Mill and Drag, 40¢	Hart's Pat. Lever, 20¢	Skeins, Thimble, Western list, 75¢ & 75¢ to 10¢	Stocks and Dies—
Atkins' One-Man Saw, with handles, # foot 40¢	Dixson's Star, 25¢	Columbus Wrt. Steel, Special net price, 40¢ to 10¢	Blacksmith's
Peace Circular and Mill, 45¢	Leopold, 40¢ & 10¢	Coldbrooke Iron Co., 60¢	Waterford Goods, 40¢ to 10¢
Peace Hand Panel and Rip, 25¢	Atkin's Lever, # dos No. 1, 26¢	Seneca Falls, Pattern, 60¢	Butterfield's Goods, 40¢ to 10¢
Peace Cross Cuts, 45¢	Atkin's Criterion, # dos No. 1, 26¢	Utica F. S. T. Skeins, 60¢	Lightning Screw Plates, 25¢ to 30¢
Richardson's Circular and Mill, 45¢	Croissant (Keller), No. 1, 15¢, No. 2, 24¢, 40¢ to 10¢	Utica Turned and Fitted, 35¢	Reece's New Screw Plates, 33¢ to 50¢
Richardson's X Cuts, 45¢	Avery's Saw Set and Punch, 50¢		Reversible Ratchet, 30¢
Richardson's Hand, &c., 25¢	Chieftain H. R. Co.'s Superior, # dos 15¢, 50¢		Gardner, 25¢
C. E. Jennings & Co., Hand, Panel and Rip, 25¢			
<i>Hack Saws—</i>			
Griffin's, complete, 40¢ to 50¢			
Griffin's Hack Saw, Blades, 40¢ to 50¢			
Star Hack Saws and Blades, 25¢			
Eureka and Crescent, 25¢			
<i>Scroll—</i>			
Lester, complete, \$10.00, 25¢			
Rovers, complete, \$4.00, 25¢			
Barnes' Builders' and Cabinet Makers', \$15., 25¢			
Barnes' Scroll Saw Blades, 25¢			
<i>Saw Frames—</i> See Frames, Saw.			
<i>Saw Sets—</i> See Sets, Saw.			
<i>Saw Tools—</i> See Tools, Saw.			
<i>Scales—</i>			
Hatch, Counter, No. 171, good quality, # dos \$21.00			
Hatch, Tea, No. 161, # dos \$6.75 & \$7.00			
Union Platform, Plain, \$2.10 & 2.25			
Union Platform, Striped, \$2.40 & 2.50			
Chatillon's Grocers' Trip Scales, 50¢			
Chatillon's Eureka, 25¢			
Chatillon's Favorite, 40¢			
Family, Turnbulls, 30¢ & 30¢			
Ricbie Bros.' Platform, 40¢			
<i>Scale Beams—</i> See Beams, Scale			
<i>Scissors, Fluting—</i> 45¢			
<i>Scrapers—</i>			
Adjustable Box Scraper (S. R. & L. Co.) \$6.50, 30¢ & 10¢			
Box, 1 Handle, # dos \$4.00, 10¢			
Box, 2 Handle, # dos \$6.00, 10¢			
Defiance Box and Ship, 20¢ & 10¢			
Foot, 50¢ & 10¢			
Ship, Common, # dos \$3.50 net			
Ship, R. I. Tool Co., 10¢			
<i>Screen Window and Door Frames—</i> See Frames.			
<i>Screw Drivers—</i> See Drivers, Screw.			
<i>Screws—</i>			
Bench and Hand—			
Bench, Iron, 55¢ & 10¢ to 55¢ & 10¢			
Bench, Wood, Beech, # dos \$2.25			
Bench, Wood, Hickory, 20¢ & 10¢			
Hand, Wood, 25¢ & 10¢ to 25¢ & 10¢			
Lag, Hunt Point, 1st Jan., 1890, 75¢ & 10¢			
Coach and Lag, Gimlet Point, 1st Jan., 1890, 75¢ & 10¢			
Bed, 25¢ & 5¢			
Hand Rail, Sargent's, 63¢ & 10¢			
Hand Rail, H. & T. Mfg. Co., 70¢ to 10¢			
Hand Rail, Am. Screw Co., 75¢			
Jack Screws, Millers Falls list, 50¢ & 55¢			
Jack Screws, P. S. & W., 35¢			
Jack Screws, Sargent, 60¢ & 10¢ to 60¢ & 10¢			
Jack Screws, Stearns', 40¢ to 40¢ to 10¢			
<i>Cork—</i>			
Humason & Beckley Mfg. Co., 40¢ to 50¢			
Williamson's, 33¢ to 33¢, 5¢			
Howe Bros. & Hulbert, 35¢			
<i>Machine—</i>			
Flat Head, Iron, 55¢			
Round Head, Iron, 50¢			
Wood—			
List January 1, 1891.			
Flat Head Iron, 72¢ to 10¢			
Round Head Iron, 67¢ to 10¢			
Flat Head Brass, 71¢ to 10¢			
Round Head Brass, 65¢ to 10¢			
Flat Head Bronze, 72¢ to 10¢			
Round Head Bronze, 65¢ to 10¢			
Rogers' Drive Screws, 83¢ to 10¢			
<i>Scroll Saws—</i> See Saws, Scroll.			
<i>Scythes—</i>			
Grain, 40¢ & 50¢ & 10¢			
Grass, 40¢ & 10¢ & 5¢			
<i>Scythe Snaths—</i> See Snaths, Scythe.			
<i>Sets—</i>			
Aiken's Sets, Awls and Tools, No. 20, # dos \$1.00, 55¢ & 10¢			
Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$9, 25¢ & 25¢ & 10¢			
Miller's Falls Adj. Tool Hds., Nos. 1, \$12; 2, \$18, 25¢			
Henry's Combination Hft., # dos \$6.50			
Brad Sets, No. 42, \$10.50; No. 43, \$12.50, 70¢ & 10¢			
Stanley's Excelsior: No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.00, 30¢ & 10¢			
<i>Nails—</i>			
Square, # gr., \$4.00 & \$4.25			
Round, # gr., \$4.00 & \$4.25			
Buck Bros., 27¢ to 50¢			
Cannon's Diamond Point, # gr., \$12, 20¢			
Rivet, Regular list, 50¢ & 10¢			
<i>Saw—</i>			
Stillman's Genuine, # dos \$5.00 & 7.5¢			
Stillman's Imita., # dos \$3.25 & 5.25			
Common Lever, # dos \$2.00, 10¢ & 5¢			
Morrill's No. 1, \$15.00; Nos. 2, \$24.00, 40¢ to 10¢ to 5¢			
Leach's, No. 0, \$9.00; No. 1, \$15, 15¢ to 20¢			
Smith's, # dos \$10¢ & 20¢ & 10¢			
<i>Shovels and Tongs—</i>			
Iron Head, 60¢ to 60¢ & 10¢			
Brass Head, 60¢ to 60¢ & 10¢			
<i>Sieves—</i>			
Mann's Tin Rim, 50¢ & 25¢			
Buffalo Metallic, S. S. & Co., 50¢ & 25¢			
Shaker (Barier's Pat.) Flour Sifters, # dos \$2.00; # gr. \$21.00			
Electric, # dos \$2.00			
A. & W. Sifters, # dos \$2.00			
Hunter's, # dos \$2.00			
Smith's Adjustable Sifters, # dos \$2.00			
<i>Standard Fiber Ware—</i> See Ware.			
Standard Fiber, Standard Fiber.			
<i>Staples—</i>			
Bind.—			
Barbed, 1 in. and larger, # B 70¢ to 10¢			
Barbed, 1/2 in. # B 80¢ to 10¢			
<i>Standard Fiber Ware—</i> See Ware.			
Standard Fiber, Standard Fiber.			
<i>Staples—</i>			
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<i>Staples—</i>			
Bind.—			</td

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s
list..... 50@10%

Tapes, Measuring—

American..... 40@40@5%

Spring..... 40@5%

Chesterman's, Regular list..... 35@30%

Thermometers—

Tin Case..... 30@30@10%

Thimble Skeins—See Skeins.

Ties, Bale—Steel
Standard Wire, list..... 50@10@5%

Tinners' Shears, &c.,—See Shears, Tinner's, &c.

Tinware—

Stamped, Japanned and Pieced, list Jan. 20 1887..... 70@10@70@10@5%

Tire Benders, Upsetters, &c.—
See Benders and Upsetters, Tire.

Tools.

Coopers'—
Bradley's..... 20@5%

Barton's..... 20@20@5@5%
L. & J. White..... 20@5%

Albertson Mfg. Co..... 25@5%

Beatty's..... 30@5%

Sandusky Tool Co..... 30@30@5%

Shaves, Cincinnati Tool Co..... 20@5%

Lumber.

Ring Peavies, "Blue Line"..... 20@50@5%

Ring Peavies, Common..... 20@21@50@5%

Steel Socket Peavies..... 20@21@50@5%

Mall, Iron Socket Peavies..... 20@21@50@5%

Cant Hooks, "Blue Line"..... 20@21@50@5%

Cant Hooks, Common Finish, #dos@14@5%

Cant Hooks, Mall, Socket Clasp, "Blue Line" Finish..... 20@21@50@5%

Cant Hooks, Mall, Socket Clasp, Common Finish..... 20@21@50@5%

Cant Hooks, Clip Clasp, "Blue Line" Finish..... 20@21@50@5%

Cant Hooks, Clip Clasp, Common Finish..... 20@21@50@5%

Hand Spikes..... 20@21@50@5%

20@20@50@5%

Pike Poles, Pike & Hook, #dos, 12 ft., \$1.50; 14 ft., \$1.25; 16 ft., \$1.45; 18 ft., \$1.75; 20 ft., \$2.50.

Pike Poles, Pike only, #dos, 12 ft., \$1.00; 14 ft., \$1.00; 16 ft., \$1.00; 18 ft., \$1.00; 20 ft., \$2.00.

Pike Poles, not ironed, #dos, 12 ft., \$6.00; 14 ft., \$7.00; 16 ft., \$9.00; 18 ft., \$12.00; 20 ft., \$16.00.

Setting Poles, #dos, 12 ft., \$14.00; 14 ft., \$16.00; 16 ft., \$17.00.

Swamp Hooks..... 20@21@50@5%

Saw.

Atkins' Perfection..... 20@21@50@5%

Atkins' Excelsior..... 20@21@50@5%

Atkins' Giant..... 20@21@50@5%

Tobacco Cutters—See Cutters, Tobacco.

Transom Litters—See Litters, Transom.

Traps—

Game—

Newhouse..... 40@40@5%

Oneida Pattern..... 70@10@5%

Game, Blake's Patent..... 40@10@5%

Mouse and Rat—

Mouse Wood, Choker, #dos@10@12@14@16@18@20@22@24@26@28@30@32@34@36@38@40@42@44@46@48@50@52@54@56@58@60@62@64@66@68@70@72@74@76@78@80@82@84@86@88@90@92@94@96@98@100@102@104@106@108@110@112@114@116@118@120@122@124@126@128@130@132@134@136@138@140@142@144@146@148@150@152@154@156@158@160@162@164@166@168@170@172@174@176@178@180@182@184@186@188@190@192@194@196@198@200@202@204@206@208@210@212@214@216@218@220@222@224@226@228@230@232@234@236@238@240@242@244@246@248@250@252@254@256@258@260@262@264@266@268@270@272@274@276@278@280@282@284@286@288@290@292@294@296@298@299@300@301@302@303@304@305@306@307@308@309@310@311@312@313@314@315@316@317@318@319@320@321@322@323@324@325@326@327@328@329@330@331@332@333@334@335@336@337@338@339@340@341@342@343@344@345@346@347@348@349@350@351@352@353@354@355@356@357@358@359@360@361@362@363@364@365@366@367@368@369@370@371@372@373@374@375@376@377@378@379@380@381@382@383@384@385@386@387@388@389@390@391@392@393@394@395@396@397@398@399@399@400@401@402@403@404@405@406@407@408@409@410@411@412@413@414@415@416@417@418@419@420@421@422@423@424@425@426@427@428@429@430@431@432@433@434@435@436@437@438@439@440@441@442@443@444@445@446@447@448@449@450@451@452@453@454@455@456@457@458@459@460@461@462@463@464@465@466@467@468@469@470@471@472@473@474@475@476@477@478@479@480@481@482@483@484@485@486@487@488@489@490@491@492@493@494@495@496@497@498@499@499@500@501@502@503@504@505@506@507@508@509@510@511@512@513@514@515@516@517@518@519@520@521@522@523@524@525@526@527@528@529@530@531@532@533@534@535@536@537@538@539@540@541@542@543@544@545@546@547@548@549@550@551@552@553@554@555@556@557@558@559@559@560@561@562@563@564@565@566@567@568@569@569@570@571@572@573@574@575@576@577@578@579@579@580@581@582@583@584@585@586@587@588@589@589@590@591@592@593@594@595@596@597@598@599@599@600@601@602@603@604@605@606@607@608@609@609@610@611@612@613@614@615@616@617@618@619@619@620@621@622@623@624@625@626@627@628@629@629@630@631@632@633@634@635@636@637@638@639@639@640@641@642@643@644@645@646@647@648@649@649@650@651@652@653@654@655@656@657@658@659@659@660@661@662@663@664@665@666@667@668@669@669@670@671@672@673@674@675@676@677@678@679@679@680@681@682@683@684@685@686@687@688@689@689@690@691@692@693@694@695@696@697@698@699@699@700@701@702@703@704@705@706@707@708@709@709@710@711@712@713@714@715@716@717@718@719@719@720@721@722@723@724@725@726@727@728@729@729@730@731@732@733@734@735@736@737@738@739@739@740@741@742@743@744@745@746@747@748@749@749@750@751@752@753@754@755@756@757@758@759@759@760@761@762@763@764@765@766@767@768@769@769@770@771@772@773@774@775@776@777@778@779@779@780@781@782@783@784@785@786@787@788@789@789@790@791@792@793@794@795@796@797@798@799@799@800@801@802@803@804@805@806@807@808@809@809@810@811@812@813@814@815@816@817@818@819@819@820@821@822@823@824@825@826@827@828@829@829@830@831@832@833@834@835@836@837@838@839@839@840@841@842@843@844@845@846@847@848@849@849@850@851@852@853@854@855@856@857@858@859@859@860@861@862@863@864@865@866@867@868@869@869@870@871@872@873@874@875@876@877@878@879@879@880@881@882@883@884@885@886@887@888@889@889@890@891@892@893@894@895@896@897@898@898@899@899@900@901@902@903@904@905@906@907@908@909@909@910@911@912@913@914@915@916@917@918@919@919@920@921@922@923@924@925@926@927@928@929@929@930@931@932@933@934@935@936@937@938@939@939@940@941@942@943@944@945@946@947@948@949@949@950@951@952@953@954@955@956@957@958@959@959@960@961@962@963@964@965@966@967@968@969@969@970@971@972@973@974@975@976@977@978@979@979@980@981@982@983@984@985@986@987@988@989@989@990@991@992@993@994@995@996@997@998@999@999@1000@1001@1002@1003@1004@1005@1006@1007@1008@1009@1009@1010@1011@1012@1013@1014@1015@1016@1017@1018@1019@1019@1020@1021@1022@1023@1024@1025@1026@1027@1028@1029@1029@1030@1031@1032@1033@1034@1035@1036@1037@1038@1039@1039@1040@1041@1042@1043@1044@1045@1046@1047@1048@1049@1049@1050@1051@1052@1053@1054@1055@1056@1057@1058@1059@1059@1060@1061@1062@1063@1064@1065@1066@1067@1068@1069@1069@1070@1071@1072@1073@1074@1075@1076@1077@1078@1079@1079@1080@1081@1082@1083@1084@1085@1086@1087@1088@1089@1089@1090@1091@1092@1093@1094@1095@1096@1097@1098@1099@1099@1100@1101@1102@1103@1104@1105@1106@1107@1108@1109@1109@1110@1111@1112@1113@1114@1115@1116@1117@1118@1119@1119@1120@1121@1122@1123@1124@1125@1126@1127@1128@1129@1129@1130@1131@1132@1133@1134@1135@1136@1137@1138@1139@1139@1140@1141@1142@1143@1144@1145@1146@1147@1148@1149@1149@1150@1151@1152@1153@1154@1155@1156@1157@1158@1159@1159@1160@1161@1162@1163@1164@1165@1166@1167@1168@1169@1169@1170@1171@1172@1173@1174@1175@1176@1177@1178@1179@1179@1180@1181@1182@1183@1184@1185@1186@1187@1187@1188@1189@1189@1190@1191@1192@1193@1194@1195@1196@1197@1198@1198@1199@1199@1200@1201@1202@1203@1204@1205@1206@1207@1208@1209@1209@1210@1211@1212@1213@1214@1215@1216@1217@1218@1219@1219@1220@1221@1222@1223@1224@1225@1226@1227@1228@1229@1229@1230@1231@1232@1233@1234@1235@1236@1237@1238@1239@1239@1240@1241@1242@1243@1244@1245@1246@1247@1248@1249@1249@1250@1251@1252@1253@1254@1255@1256@1257@1258@1259@1259@1260@1261@1262@1263@1264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